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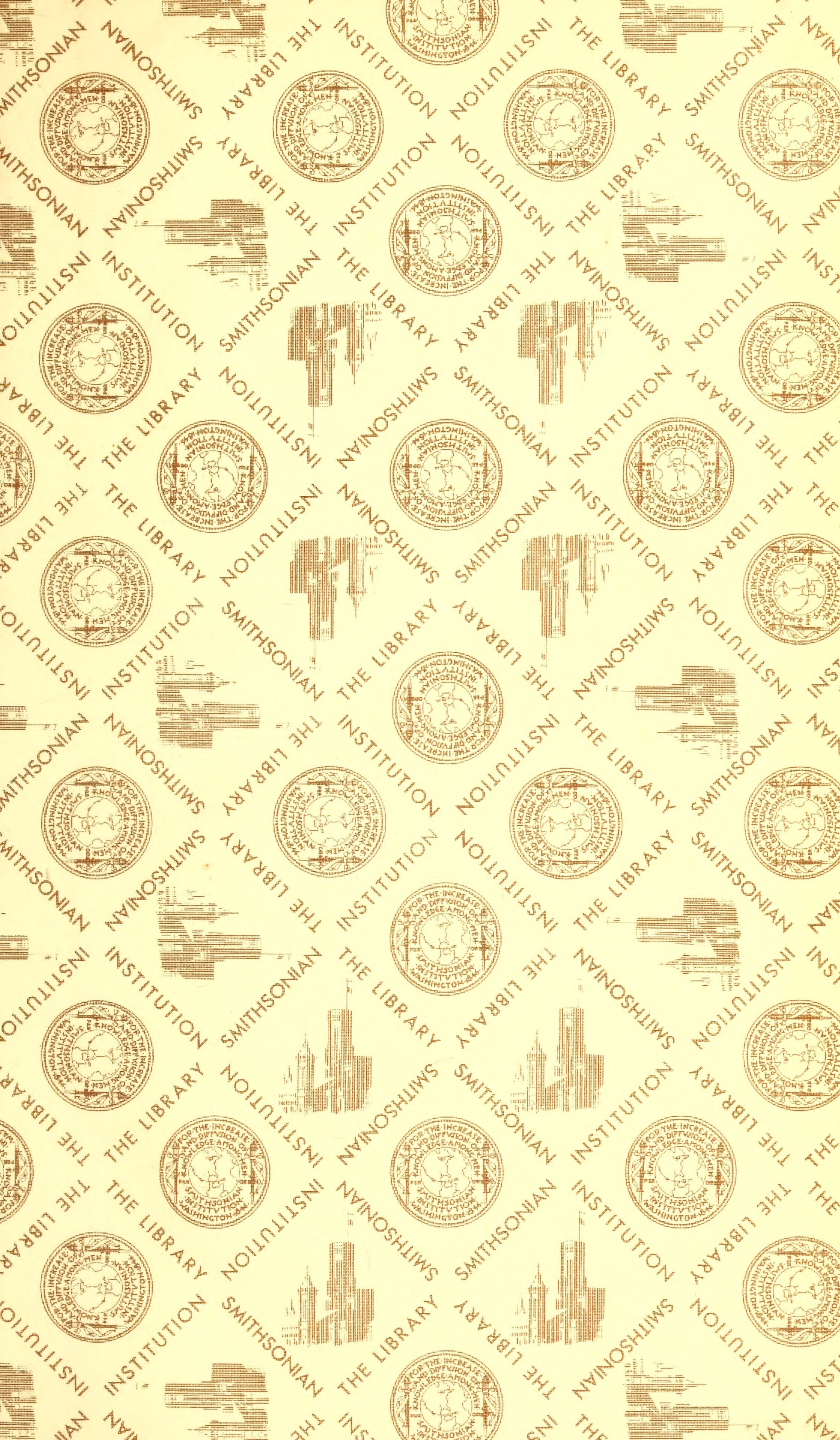
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PROCEEDINGS

OF THE

Bristol Naturalists' Society

VOLUME XXVIII, 1949–1953

EDITED BY S. SIMPSON AND H. W. TURNER

ASSISTED BY A COMMITTEE

"Rerum cognoscere causas."—Virgil

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FEB 6 1957
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28

1949

PROCEEDINGS

OF THE

Bristol Naturalists' Society

EDITED BY H. W. TURNER, ASSISTED BY A COMMITTEE

BRISTOL NATURALISTS' SOCIETY

"Rerum cognoscere causas."—Virgil.

PRINTED FOR THE SOCIETY
AT THE BURLEIGH PRESS, BRISTOL

Issued August 4th, 1950

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H. W. Turner, Esq.,
The University,
Bristol, 8

NOT LATER THAN JAN. 31.

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NATIONAL MUSEUM

VOL. XXVIII, PART I, 1949

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Instructions to Authors

1. All matter offered for publication in the *Proceedings* must be sent to the Hon. Editor.
2. To ensure consideration for inclusion in the next issue, contributions must be received not later than January 31.
3. All copy must be type-written (preferably double-spaced) or in very clear manuscript and, in either case, with good margins.
4. Copy submitted is not returnable and authors are advised to keep a duplicate.
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REPORT OF COUNCIL

1949

THE membership strength of the Society has been maintained.

At the Annual General Meeting, Mr. F. W. Evens was re-elected President and Mr. H. W. Turner and Mr. J. H. Savory were elected Vice-presidents. Other Officers and Council were elected as shown in the list on page 2 of this issue of the *Proceedings*.

The Society has again had a year of well-attended and successful meetings and has been well-favoured by the services of lecturers of high quality and by carefully planned and well-guided excursions.

Dr. L. R. Moore, Hon. Secretary, left Bristol during the year and, in the absence of a successor, Miss M. H. Rogers, Assistant Hon. Secretary, temporarily undertook the duties of Secretary.

The deaths of Professor S. H. Reynolds, Mr. J. Rooke Corbett and Mr. H. Vicars Webb were recorded with regret during the year.

HON. LIBRARIAN'S REPORT

1949

WORK on the collating and cataloguing of journals has continued during the year ; a small section only of the library now remains to be dealt with and, when that is completed, the Hon. Librarian's main concern will be the overtaking of arrears of binding. The Society is again indebted to several institutions with which it exchanges publications, for help in filling the lacunae in its runs of periodicals ; the Royal Society of Victoria and the Birmingham Natural History Society have each sent 4 parts of their journals for this purpose, and the Queckett Microscopical Society two. Gifts have been received from Mrs. Williams (1 volume), the Botanical Section (4 volumes) and the late Professor Reynolds (18 volumes) ; the Society's thanks and appreciation have been conveyed to the donors.

Two hundred and seventy-five parts or volumes of periodicals have been received in exchange for the Society's *Proceedings* during the year. Six numbers of journals have been purchased for completing broken runs, and 8 volumes of separate works have also been purchased. The subscription volume has been received from the *Zoological Record* Committee, but no volume has been published by the Ray Society during the year. Sixty-six volumes have been returned from the binders.

Members have used the library to about the same extent as last year, 290 volumes having been borrowed by 42 members.

L. HARRISON MATTHEWS, *Hon. Librarian*

The Hon. Treasurer in Account with the Bristol Naturalists' Society

RECEIPTS AND PAYMENTS FOR THE YEAR ENDING DECEMBER 31, 1949

Dr

1948 £ s. d.			£ s. d.	£ s. d.	£ s. d.
	To Members' Subscriptions :—				
	Full—				
		1948 ..	3 5 0		
		1949 ..	239 3 0		
		1950 ..	2 10 0	244 18 0	
	2nd in house	1948 ..	1 0 0		
		1949 ..	18 15 0		
		1950 ..	10 0	20 5 0	
	Country—				
		1948 ..	5 0		
		1949 ..	19 11 0	19 16 0	
270 11 0					284 19 0
11 1 0	" Old " Associates	1949 ..			8 15 6
9 3 6	" New " ,,	1949 ..			6 10 0
7 5 0	Affiliated Societies	1949 ..			7 0 0
298 0 6					307 4 6
87 7 6	,, Grants towards cost of *Proceedings* and Separates ..	1948 ..		22 0 0	
		1949 ..		105 4 0	
		1950 ..		50 0 0	177 4 0
4 15 0	,, Sale of Bird Lists				1 10 0
5 3 3	,, Sale of Publications				21 4 0
3 12 3	,, Interest on Deposit in Post Office Savings Bank				5 6 11
					512 9 5
188 7 0	,, Balance from last Account ..				180 5 9
587 5 6					£692 15 2

A. H. PEACH, *Hon. Treasurer*
January 1950

Cr.

1948 £ s. d.		£ s. d.	£ s. d.
	By Subscriptions :—		
1 1 0	Ray Society	1 1 0	
3 5 0	Zoological Society	3 5 0	
2 1 0	S.W. Naturalists' Union	2 1 0	6 7 0
248 1 10	,, *Proceedings* (1948)		212 3 9
27 6 11	,, Stationery and Printing		14 4 5
	,, Postages, etc. :—		
16 3 5	Hon. Secretary	23 17 7	
3 12 11	Hon. Treasurer	4 8 6	
12 3	Hon. Editor	1 3 6	
2 3 11	Hon. Librarian	2 5 11	31 15 6
1 10 0	,, Fire Insurance (Library)		1 10 0
5 6 0	,, Books and Periodcials		7 2 6
1 0	,, Rent (use of Library Room)		1 0
4 0	,, Cheque Books		8 0
4 10 0	,, Fares and Expenses of Meetings		9 17 0
– – –	,, Clerical Assistance (per Hon. Secretary) ..		6 10 0
3 11 3	,, Loss on Dinner		7 0
48 7 3	,, Book-bindings		42 19 0
1 1 0	,, Donation to Council for Promotion of Field Studies		– – –
	,, Grants to Sections :—		
5 0 0	Botanical	– – –	
3 1 0	Entomological	3 13 11	
10 0 0	Geological	12 0 0	
10 0 0	Ornithological	10 0 0	25 13 11
10 0 0	,, Grant to Field Committee		5 0 0
			363 19 1
	,, Balance to next Account :—		
61 1 0	,, Cash at Bank	87 16 0	
119 4 9	,, Deposit at Post Office Savings Bank ..	240 18 5	
– – –	Cash in hands of Assistant	1 8	328 16 1
587 5 6			£692 15 2

Audited and found correct.

Bristol, January 18, 1950

F. W. EVENS, *Hon. Auditor*

REPORT OF BOTANICAL SECTION

1949

MEMBERSHIP of the Section was good and increased during the year. Indoor meetings were held each month, consisting of talks during the winter and discussion of plants brought in through the summer, when walks were also organized for field study.

Jan. 17.	Dr. L. C. Luckwill : " Plant Hormones and Growth Substances ".
Feb. 21.	Mr. Ivor Evans : " A Botanical Holiday in N. Wales, taken with members of the Botanical Exchange Club ".
Mar. 21.	Mrs. H. H. Davis : "An Outline of Plant Ecology of the Severn Estuary from Avonmouth to Slimbridge ".
Oct. 17.	The Reverend H. C. B. Roden : " Some Observations on the Flora of South Africa on a recent six-months' visit ".
Nov. 21.	Mr. F. W. Evens : " Movement of Plants ".
Dec. 12.	Dr. A. F. Devonshire : " Botanizing in Kent ".

The summer walks were led by three of our members : Mr. Ivor Evans—along the left bank of the Avon, Winterbourne to Filton, Whitchurch to Keynsham, and in search of aliens on the Feeder Tip ; Dr. Devonshire—in the Long Ashton district, and from Thornbury to Aust ; and Mr. Payne, who arranged a coach-trip to Mendip, stopping at Compton Martin to see the church and explore the woods.

With the kind permission of Prof. Skene, visits have been paid to the University Gardens and Greenhouses.

At the Annual Exhibition, our members did not come forward as well as they did the previous year, only four showing specimens. Mr. F. W. Evens had an extensive exhibit of varied botanical interest. Mr. E. P. Gibbens showed an enlarged photograph he had taken of the Cactus House at Kew. Mr. Ivor Evans displayed plants from Cumberland and N. Wales, with some new records. Mrs. Bell exhibited *Datura Stramonium* and *Atropa Belladonna*, and a selection of plants, with views of the country, collected by Mr. H. G. Bell within the Arctic Circle in August at Abisko, Lapland.

Books placed in the Library :—

Britain's Green Mantle by Tansley
The Living Garden by Salisbury
Two *National Park Guides*—" Snowdonia " and " Forest of Dean."

A cheque was also given by the Section for the oversewing of Syme's edition of Sowerby.

ETHEL M. E. BELL, *Hon. Secretary*

REPORT OF
ENTOMOLOGICAL SECTION
1949

AT the 85th Annual General Meeting of the Section held on January 10, 1949, Mr. J. V. Pearman was re-elected President and Mr. C. S. H. Blathwayt was elected Hon. Secretary, Mr. A. H. Peach having decided not to stand again as Hon. Secretary. Mr. J. V. Pearman gave a talk at this Meeting, on "Zoological Genetics".

On Feb. 7 a "Lepidoptera Quiz" was held ; various questions on Lepidoptera were answered by four members of the Section and a discussion followed.

On March 7 Mr. S. H. Bennett of the Department of Agriculture and Horticulture of the University of Bristol gave a most interesting talk on "Systemic Insecticides"—a new branch of insect-control.

On Saturday, May 21, the Section held a full-day Field Meeting at Hod Hill, Dorset. The party left Bristol by coach soon after 9.0 a.m. and reached Hod Hill shortly before 12.0 noon. Some members collected on Hod Hill until 6 o'clock, when the coach returned to Bristol ; others went by the coach into Blandford for tea. The weather was fine and there was continuous sunshine. *Lysandra Bellargus* Rott. and *Euphydras Aurinia* Rott. were common, and some nice forms were taken of the former. Among many other species seen were a number of *Hamearis Lucina* Linn.

On Saturday, July 2, the Section held an afternoon Field Meeting at Wickwar, Glos. The weather was again perfect but insects were on the whole scarce, which was noticeably so in the case of woodland species in 1949. Some *Limentis Camilla* Linn., *Argynnis Paphia* Linn. and *Polygonia C-Album* Linn. (var. *Hutchinsonii*) were taken or seen among other species.

On Oct. 3 short talks on Lepidoptera were given by Mr. J. W. Norgrove, Mr. C. S. H. Blathwayt and Mr. K. H. Poole, followed by an informal discussion.

On Nov. 7 the Section held its Annual Exhibition Meeting, and many insects were exhibited by members, including *Maculinea Arion*, *Celerio Livornica*, *Rhodometra Sacraria* and *Sedina Buettneri*, all in some numbers.

On Dec. 5 Dr. Blachford, C.B.E., M.D., gave an interesting talk on "An Introduction to the British Coleoptera (Beetles)" and Mr. J. Baxter followed by shewing and explaining some exhibits on the subject. A general discussion followed.

C. S. H. BLATHWAYT, *Hon. Secretary*

REPORT OF GEOLOGICAL SECTION

1949

TWELVE General Meetings were held during the year, namely the Annual General Meeting and Exhibition, 5 Lecture Meetings and 6 Field Meetings. The average attendance for indoor meetings was 60 ; for outdoor meetings, approximately 30.

At the Annual General Meeting, held on Jan. 27, the following Officers were elected : Dr. Stanley Smith, President ; Mr. H. W. Turner, Vice-President ; Mr. I. S. Loupekine, Hon. Secretary ; Mrs. A. Marsden, Hon. Treasurer ; Mr. D. T. Donovan, Recorder ; and Mr. G. E. J. McMurtrie, Hon. Auditor. Sir Lewis Fermor, Dr. A. Marsden, Mr. G. S. Maunder, Mr. H. S. Shinner, Dr. F. S. Wallis, and Professor W. F. Whittard were appointed Committee Members. The formal business was followed by an Exhibition of Members' Collections, which comprised 29 individual exhibits of varied nature.

On Feb. 17 Professor David Williams (Imperial College of Science and Technology, London) gave an illustrated lecture on " Minerals and World Affairs ", in which he showed the importance of minerals in modern industry and their influence on society.

On March 17 Professor W. F. Whittard spoke on " The Decay of Building Stones ", using as illustrations a fine set of coloured photographs taken of buildings in and about Bristol.

Of the six Field Meetings held during the Summer, one was a whole-day, three were afternoon, and two were evening excursions : a motor-coach was hired on three occasions. On April 30 Mr. Loupekine led an afternoon party to Yate and Chipping Sodbury. On May 28 a day was spent at Cannington Park and North Quantocks, Somerset, where, under the leadership of the President, Devonian, Carboniferous and Mesozoic rocks were examined. On June 29 the Section paid an evening visit to Aust, where Professor Whittard demonstrated the intricate geology of the area. On July 23 Mr. M. L. K. Curtis led a coach party over the complicated Silurian inlier at Tortworth. On Aug. 18 Mr. T. R. Fry led an evening party to Bedminster Down, where Liassic fossils were collected in abundance. Finally, on Sept. 24, the Section was privileged to enjoy the leadership of Dr. F. B. A. Welch in the Clevedon area.

On Oct. 18 Dr. F. Coles Phillips lectured on " Geological Clocks ", reviewing the earlier attempts at geochronology and dealing in detail with the modern methods which utilise radioactivity.

On Nov. 17 Dr. K. S. Sandford (Department of Geology, University of Oxford) gave his " Notes on the ' Lower Palæozoic Geosyncline ' in the Spitsbergen Group ", which was illustrated by a fine set of aerial photographs taken from 12,000 ft. At this meeting Mr. D. T. Donovan showed and commented upon a selection of coloured photographs which he took during the Lauge Koch Expedition to East Greenland, 1949.

On Dec. 13 Mr. D. E. Coombe (Christ's College, Cambridge) gave an illustrated talk on " Botany with a Geological Map ", which was appreciated by the botanists and geologists alike.

It is with the utmost regret that the Section records the deaths of Professor S. H. Reynolds and Mr. J. R. Corbett, who passed away in August.

I. S. LOUPEKINE, *Hon. Secretary*

REPORT OF ORNITHOLOGICAL SECTION

1949

"THE WREN THE WREN
THE KING OF ALL BIRDS . . ."

IT is with much pleasure that we report another successful year. Meetings have been held chiefly in the Physiology Lecture Theatre, University of Bristol, and there has been an average attendance of 79, with a maximum of about 230 to see a splendid colour-film of bird-life in the Camargue, in the Physics Department, Royal Fort.

At the Annual General Meeting in *January* Mr. W. R. Taylor and Mr. H. H. Davis were re-elected as President and Hon. Secretary respectively. For the inauguration of a Summer Field-work Programme, the following Field-work Committee was elected :—Mr. A. E. Billett (Chairman), Mr. R. H. Poulding (Hon. Secretary), and Messrs. H. J. Boyd, G. E. Clothier, H. H. Davis, and B. King. The *February* meeting was the occasion for a joint fixture with the Royal Society for the Protection of Birds. A most entertaining lantern-lecture entitled " Field Studies of Reed- and Sedge-Warblers ", the outcome of wartime observations at North Cotes, Lincolnshire, was given by Mr. P. E. Brown, who then showed a unique film, obtained in Holland, to illustrate the complete breeding cycle of the Great Reed-Warbler from the commencement of the nest to the final departure of the young. In *March*, members were privileged to see Mr. Walter Higham's latest film, " The Breeding Birds of the Camargue "—the result of a visit to the Rhone Delta in 1948. This, largely featuring the Flamingo but also showing such attractive species as Bee-eater, Purple Heron, Kentish Plover, Black-winged Stilt, Pratincole and Whiskered Tern, may, for sheer beauty and accuracy of colour, justly be described as one of the finest ornithological films yet presented to the public.

The *September* meeting included short communications by several members and an exhibition of locally taken photographs by Mr. P. S. Gale. In *October* Mr. N. W. Moore gave an extremely interesting talk on " European and Tropical Birds in Gambia ", based on observations when, in collaboration with the Oxford University Exploration Club, he visited that area in 1948. The lecturer amplified his remarks with skins, distribution maps and colour-pictures on the screen. The *November* meeting was devoted to a highly instructive lecture by Mr. P. H. T. Hartley, on " Routines of Bird-life ". Illustrating his talk with slides to show a fascinating series of graphs, the lecturer dealt chiefly with food, song and the question of what birds do in their spare time. In *December* another most informative lecture was given when Dr. W. H. Thorpe spoke on " The Learning Abilities of Birds " and referred especially to learning by trial and error, insight-learning, imitation and the learning of song.

Support for the Summer Field-work Programme has shown a marked improvement over that of the previous year. Activities have included a watch for migrant Swifts in May, a Lapwing survey covering various parts of the district, duck-counts at the reservoirs, bird-ringing and the completion of nest-cards for the Edward Grey Institute.

A large attendance gathered for an evening field-walk in Blaise Castle Woods, Henbury, on May 18, while on the 27th, despite dull and rainy weather, about twenty members took part in an evening walk to Savage's Wood, Stoke Gifford.

We record with deep regret the death of Professor S. H. Reynolds, a member of the Section from its earliest days, and of Mr. H. Vicars Webb, who will be remembered for the great part he played for many years in local ornithology.

H. H. DAVIS, *Hon. Secretary*

ACCOUNT OF THE GENERAL MEETINGS

1949

THE 86th Annual General Meeting was held on Jan. 13, the Annual Dinner on Jan. 20, and the Exhibition Meeting on Sept. 29. "Lecture" meetings on Feb. 3, March 3, Oct. 3, Nov. 3 and Dec. 1 were addressed by Professor C. F. C. Hawkes, Mr. L. F. J. Brimble, Mr. F. L. Vanderplank, Mr. C. E. Neal and Mrs. D. P. Dobson respectively. Attendances ranged from 35 to 129, with an average of 66. There were also General Field Meetings.

At the Annual General Meeting the election of the new Council was completed, and Mr. F. W. Evens was unanimously re-elected President, and delivered his Presidential Address on "From Fable to Fact, and from Fact to Fact: notes on the development of Natural History studies".

The President stated that a naturalist is defined as one who observes natural phenomena. Observation is fundamental, and records of observations constitute the basic material of Natural History.

Primitive man had everything to learn. His capacity for conceptual thinking led to art, religion and science, scarcely separable from one another, and to the practical discoveries of the use of fire, domestication of animals, and beginnings of agriculture.

Folklore resulted from tales man told of the world around him, and in stories and fables survives to-day.

The Natural History of the Greek world finds expression in its vast literature, but its main importance to the naturalist is the important, original observations of Aristotle and others. "Science is just the Greek way of looking at things" (Burnet).

For a thousand years the Dark Ages followed, when men were satisfied with fables, traditional anecdotes, the bestiaries, and tales like "Reynard the Fox". (The story of the crocodile and the bird was given by way of illustration, and Canon C. E. Raven quoted, fully, on this period.)

The mental framework which had survived for many centuries was rapidly broken up by the Renaissance, the Reformation and the Discovery of the New World, which put mankind again on the march.

Men at first looked backward to the authority of the Greeks but the writings of Francis Bacon gave an impetus to the collection of facts, whilst at the same time he looked forward and turned his back to the past.

Some notes were given of the laborious indexing of the book of nature, culminating in the *Systema Naturæ* of Linnæus. The link between the apothecary, the gardener and the botanist was also referred to.

Whilst naturalists were collecting specimens in all branches of Natural History, others were perfecting the tools—such as microscopes, telescopes, field-glasses and, later on, the camera—which enabled further advances to be made.

The early history of geology was referred to, and its rapid, modern advance, and the linkage between the past and present world of life.

During the 17th and 18th centuries, naturalists were collecting a vast, further store of facts and observations, and explorers were at work all over the world. Sir Joseph Banks, Robert Brown, Charles Darwin and Alfred Russell Wallace were used to illustrate this development.

In 1838–39 Schwann & Schleiden established the existence of the cell, the foundational unit of all forms of living things.

In 1859 Darwin (joining with Wallace) announced the discovery of natural selection as the means for the preservation of favoured races in the struggle for life. Darwin's *Origin of the Species* was epoch-making in the history of human thought.

The writings of both Darwin and Wallace showed the complex relations which existed between flower and insect, bird and insect, animals and plants, leading to an outdoor study of living things.

The modern naturalist follows these great men into the "great out-of-doors". He finds that no living thing lives in entire isolation. It enters into a larger pattern, and these patterns are woven intricately into a great web of life.

In our temperate climate, we have the advantage of the rhythmic changes of the seasons and can watch the changing scenes of Nature's drama unfold from day to day.

At the close of the address, Mr. H. W. Turner, taking the chair as Senior Vice-President, thanked Mr. F. W. Evens for his address and closed the meeting.

At the annual Dinner, held at the Grand Hotel, the Guest of Honour was Field-Marshal The Right Honourable the Viscount Alanbrooke, K.G., G.C.B., O.M., D.S.O. Field-Marshal Alanbrooke showed and explained two films (in colour) taken on the New Grounds, and a further film of "The Oyster Catcher". The films and the speaker's exposition were greatly appreciated.

At the February meeting, Professor Hawkes spoke on "Modern views of Ancient Britain", beginning with the Neolithic period. He used lantern slides to describe the movements of peoples, their implements and domestic utensils and their burials, in this period and in the subsequent Bronze and Iron Ages down to the time of Romano-British culture.

In March, Mr. L. F. J. Brimble, B.Sc., F.L.S., gave an interesting, original and provocative lecture on "The Approach to Biology through Natural History". Mr. Brimble considered there was too much utilitarian biology, that the content of biology was too often botany and zoology and that biology as a subject was poorly taught. The remedy, he felt, lay in the work of Natural History Societies, and their function he outlined as keeping local records,bridging the gap between the field-workers and the specialist-investigators and encouraging the interest of youth in truly biological facts. He looked forward to a centralised publication of Natural History Societies' activities.

At the Exhibition Meeting on Sept. 29 very few of the exhibits made by members were of "Things Harmful to Mankind", the feeling evidently being that many things poisonous in large quantities are, by the skill of scientists, of benefit when taken in small quantities.

In October, Mr. F. L. Vanderplank, B.Sc., gave an account of his experiences as "A Naturalist in Nigeria and the Cameroons". His primary interest out there was a study of the tsetse fly and he gave an interesting and comprehensive survey of the Natural History of the regions in which he worked. He contrasted the plant and animal life of the rain-forests with that of the semi-desert, thornbush areas, and showed, in the latter, the great difference between the dry season and the rainy season. Mr. Vanderplank illustrated his talk by several excellent films and photographs, some in black and white, and others in colour. As well as giving a good idea of the different types of habitat, these showed many kinds of birds, reptiles, scorpions and millepedes, and numerous insects. Among the more unusual film-shots were seen the actual wing-beats of a tsetse fly (taken with an exposure of 300 millionths of a second), glimpses of life inside a termite colony, and an amazing record of a Hunting Wasp building its cells.

At the November meeting, Mr. E. G. Neal gave a most interesting and delightful talk on "The Badger", illustrated by excellent lantern slides. He followed three main lines of investigation—food, hibernation and the breeding cycle—and members showed their appreciation by joining in a lively discussion afterwards. A pet Badger was brought to the meeting by a member of the audience.

The December meeting was addressed by Mrs. D. P. Dobson, J.P., Litt.D., F.S.A., who gave a discursive and witty talk on "Korea, its people, life and land", interspersed with anecdotes of her own personal experiences en route from Cairo to Karachi, Calcutta, Bangkok, Shanghai, Hong Kong and Peking. The lecture was illustrated by lantern slides and excellent coloured Kodachrome negatives.

FIELD MEETINGS

The opening meeting of the session was held on April 9. One party, led by Mr. and Mrs. B. W. Avery, with Mr. R. F. Harvey as co-leader, walked from Congresbury, and a second party, led by Mr. F. W. Evens, walked from Nailsea and Backwell station, the parties meeting at the top of Brockley Combe and then walking to Flax Bourton over Broadfield Down. About 40 species of plants were observed in flower. Yew flowers were shedding their pollen, and Ash was in flower. Hornbeam and Horse Chestnut were both in leaf-bud, the latter also showing flower-buds. Amongst other birds, the Chiffchaff and Willow Warbler were seen and heard. An exposure of igneous rock at Goblin Combe was visited.

On May 14 Messrs. G. H. Beacham and A. C. Leach, and Dr. F. S. Wallis were the leaders to the Eastern Mendip. At Stoke Lane, Mr. T. H. Stanbury, Secretary of the Bristol Exploration Club, explained the chief features of the Stoke Lane Swallet and showed members the entrance taken by cavers. At Beacon Hill several members described the geology, botany, and entomology of the area, after which the igneous rock in Moon's Hill quarry was inspected and specimens were collected. Some interesting mineral veins were encountered.

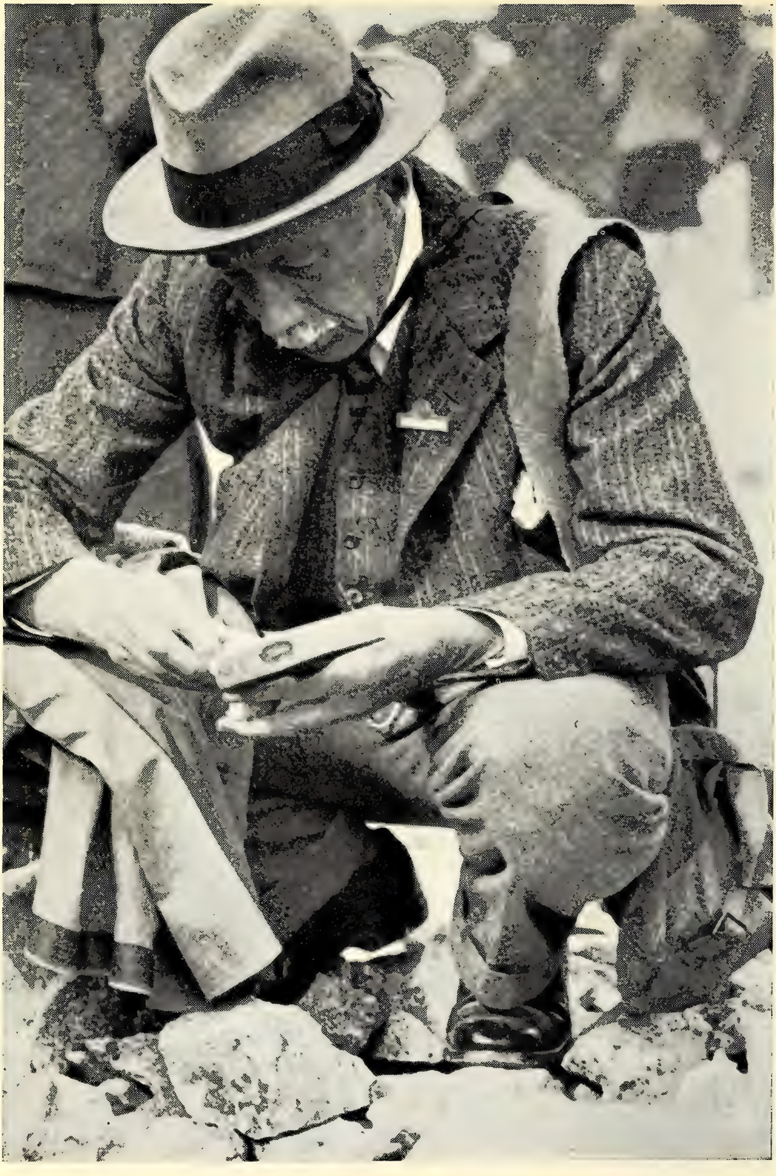
On June 18 the meeting was a whole-day one, when the Tetbury and Malmesbury district was visited with Mr. H. O. Edmonds as leader. The Giant's Cave (the remains of a Long Barrow) was visited near Great Badminton. At Crow Down the party walked to the place where one of the three, large, permanent springs forming the sources of the River Avon leaves the ground. A short visit was made to the ancient church of Didmarton on the way to Tetbury. The party walked along the Fosseway at Fossebridge and on to Brockenborough. At Malmesbury the Abbey and the meeting-place of the two rivers were visited. On the way back to Bristol stops were made at the small Cotswold village of Easton Grey and at Shirehill where the road crosses the main source of the Broadmead.

Mr. and Mrs. A. C. K. Fear were the leaders on July 16 to the Stroud area. At the top of Uley Hill many members ventured inside Hetty Pegler's Tump, a Neolithic Long Barrow, dating from 2000 B.C. and yielding 28 skeletons when first excavated in 1864. An interesting half-hour was spent at the Midland Fisheries in Nailsworth, where trout at various stages of their life were seen. At Rodborough Common, Mount Surat quarry was visited and the leaders explained the non-sequence between the Upper Inferior Oolite, represented by the Upper Trigonia Grit (very fossiliferous), and the underlying Upper Freestone of the Lower Inferior Oolite. Much interesting flora was found on the common. The Nympsfield Long Barrow, in the locality of which an abundance of Deadly Nightshade was noted, was inspected. A halt was made at Frocester, with its 13th-century tithe-barn, and a visit paid to Leonard Stanley Priory.

On Aug. 13 Messrs. T. H. Payne and I. Evans led the meeting on Mendip. At Burrington Combe the site of the Roman Ampitheatre was visited and the party walked on one of the Roman roads. The "slag-heaps", old washing-pools, etc., were examined at the "minery" at Charterhouse. The party walked via Tynings Farm to Beacon Point on Blackdown, from where such distant landmarks as North Hill, Minehead, and Dunkery Beacon were visible.

The last meeting was held on Sept. 10, with Dr. A. F. Devonshire and Mr. R. Goodfellow as leaders to the Woodspring Priory region. The priory (in private ownership since the dissolution of the monasteries) was viewed by permission of the present owner. The geological exposures on the west end of the Sand Point promontory were examined and many fossils appropriate to the respective beds were found. The excellent example of a raised beach was also examined. The botanists, too, had much to interest them amongst the flora of the beach and salt-marsh.

J. E. HAGUE, *Hon. Secretary, Field Committee*



S. H. REYNOLDS, M.A., Sc.D., F.G.S.

[*To face p. 15*

OBITUARY

Sidney Hugh Reynolds (1867–1949)

THE death on August 20, 1949, of Dr. S. H. Reynolds deprived the Society, and especially the Geological Section, of one of its most senior and devoted members.

Reynolds seems to have become a member of the Council of the Society as early as 1895, and also in that year a member of a Secretarial Committee of three which appears to have been formed. From 1899 to 1905 he was the Society's Hon. Secretary, and from 1901 to 1934 he was President of the Geological Section.

During the long period that Reynolds was a member of the Society, there was no more constant contributor to its *Proceedings* and he did much to build up the reputation of our publication by his support. His first paper in the *Proceedings* appeared in 1907 (*Proc.* for 1906) on "A Bone Cave at Walton near Clevedon" and his last (" Fumeroles, Hot Springs and Geysers ") in 1941 (*Proc.* for 1940). Between these dates he contributed no fewer than 18 papers on geological subjects, either alone or in collaboration. The most notable of these was probably his revision and amplification in 1935 of Arthur Vaughan's "Avonian of the Avon Gorge" for which he had supplied the original, fine series of photos. This paper is published by the Society as a separate.

During his 34 years' presidency of the Geological Section, Reynolds was its mainstay both as lecturer and in the field : year by year he gave addresses and led parties in the Bristol district with unfailing regularity, and his great services to the Section were recognised in 1935 by a presentation, and again in 1947, when the Section was glad to congratulate him on the attainment of his eightieth birthday.

This notice has so far dealt with Reynolds' connection with our Society. Accounts of his wider activities in the geological world have appeared elsewhere, but it may be interesting to refer here to some of these. He was at school at Marlborough and then went up to Trinity College, Cambridge. He came to University College, Bristol, in 1894 as Lecturer in Geology and Zoology, under Professor Lloyd Morgan. When the University of Bristol was founded in 1909 he became the first occupant of the Chaning Wills Chair of Geology and, on his retirement in 1933, he was elected Professor Emeritus.

He was an indefatigable geological collector, and the University Department of Geology, which he built up, was largely stocked with specimens obtained by him on his expeditions, for he travelled widely both at home and abroad.

Reynolds' modesty did not hide his great worth from his fellow geologists and in 1926 he was president of Section C of the British Association at its Oxford meeting, and in 1928 the Geological Society (of which he became a Fellow in 1891) awarded him the Lyell Medal (*Proc. B.N.S.* 1928).

But Reynolds' interests were by no means confined to geology: he possessed a wide culture and was the complete naturalist as well as delighting in literature, music and art. He was also an enthusiastic games player and in his later years found much interest in watching Rugby football and county cricket. He was a very lovable man, of exceptional industry, and his passing is mourned by all his friends (and he never made an enemy)—not least by those who are his former pupils or colleagues.

H. W. T.

BRISTOL BOTANY IN 1949

By Cecil I. and N. Y. Sandwith

(*Received, Feb. 24, 1950. Read in title at General Meeting, March 2, 1950*)

THE lovely summer of 1949, from June to October, was accompanied by a long period of drought which seriously affected the root crops, and also botanical activities, many of our local plants being completely dried up before they reached maturity. It was difficult to find a single flower of *Carex humilis* here in early April, and later the plants on light, rocky soil at Keynsham and Crook Peak were completely withered. The leaves remained green on the trees much later in the year than usual, and when they did change colour their brilliant after-glow did not last long.

In a letter to *The Times* of October 1, 1949, Lt.-Col. E. B. Peacock drew attention to the existence of pomegranate trees (*Punica Granatum* L.) in basement-areas of houses in one of the residential streets in Bath. One of these not only had borne several flowers but also produced a few good-sized and healthy-looking fruits. This letter elicited several replies (Oct. 5) with much information about the age and history as well as the flowering and fruiting of pomegranate trees in this country, and it was shown that old trees had borne fruit near Chepstow and in Hampshire, while at Hampton Court a tree on the south wall of the rose garden was bearing at least 30 fruits at the time of writing. Subsequent search in Bath by Lt.-Col. Peacock led to the discovery of 8 trees. Six of them were growing in basement-areas of residential houses, all facing S. or S.W.: 3 of these had blossomed, while 2 had fruited. The other two, which were growing against houses or garden-walls, had both blossomed, but neither had fruited. In a letter to the Bath newspaper a few weeks later, Lt.-Col. Peacock reported the results of his researches and quoted one correspondent who had written that " as far back as 1874 a tree is recorded, belonging to Lady Rolle of Bicton, that covered the whole of a house in Bath and was laden with fruit this year ". He had not been able to trace the whereabouts of this tree. Other trees in our district, at South Stoke Vicarage and in the Palace Gardens at Wells, had produced their scarlet-vermilion blossoms last season but did not fruit. Lt.-Col. Peacock collected records of 32 pomegranate trees growing in this country, 20 of which blossomed last year (1949) and 7 bore fruit. " On one of the trees, in Ryde, Isle-of-Wight, the fruit actually ripened sufficiently to be eaten and ' enjoyed ' by the owner." We are indebted to Lt.-Col. Peacock for a reprint of his letter to the Bath newspaper and for other interesting details. He was unable to trace the origin of the six trees growing in the basement-areas in Bath. It may be remembered that Mr. T. H. Green's discovery of a very small bush of the pomegranate by the Avon at Bath (see " Bristol Botany in 1935 ") was the first record of its establishment as an escape in this country. We may assume that the origin of these stray trees in unorthodox places is from seed of fruits brought from abroad, just as the fig-trees on our city wharf-walls have arisen from the seeds of imported figs.

Ranunculus Lingua L. Pool by road near Walton Castle, Clevedon, **S.**, *Dr. A. F. Devonshire.* Presumably a recent introduction.

Nasturtium microphyllum Boenn. ex Reichb. In a paper in *Watsonia*, i. part iv (1950), Messrs. H. W. Howard and A. G. Lyon cite this species from Ashcott, **S.**, 1892, *R. P. Murray*, and from Shapwick, **S.**, 1892, *E. F. Linton.* They also cite the hybrid *N. microphyllum* × *officinale* from Bath, **S.**, 1839, *Babington.*

Diplotaxis tenuifolia (L.) DC. var. *integrifolia* Koch. Bombed site, St. Michael's Hill, Bristol, **G.**, *Mrs. E. M. E. Bell.*

Viola contempta Jord. sec. Drabble. Pasture, Lord's Wood, Houndstreet, **S.**, July, 1948, *I. W. Evans*, det. *R. D. Meikle.*

Polygala oxyptera Reichb. Dry, limestone bank, Rowberrow Bottom, **S.**, *C.I.S.* and *N.Y.S.* This formerly grew in rough, limestone pasture at Failand, **S.**, but the ground is now arable.

Saponaria officinalis L. In quantity in a locality between Doynton and Abson, **G.**, *E. N. Hale.*

Impatiens parviflora DC. Beggar's Bush Lane, Leigh Woods, **S.**, *I. W. Evans.* Mr. Evans writes that his record of this species from the old Brass Mill, Keynsham, **S.** (see " Bristol Botany in 1948 ") should be deleted : the plant, which was at first identified from foliage alone, turned out to be *I. capensis* Meerb., thus establishing a new locality for that species in our area.

Fragaria vesca L. With white fruit at Portishead, **S.**, *E. H. Day.*

Potentilla verna L. Rhodyate Hill, nr. Congresbury, **S.**, *I. W. Evans.*

Aphanes microcarpa (Boiss. et Reut.) Rothm. This is a second British species of Parsley Piert, whose characters have been fully discussed and illustrated by Mr. S. M. Walters in *Watsonia*, i. part iii (1949). It differs from our common plant, *A. arvensis* L., in its slender, delicate habit with long internodes, the greener (less grey-green) colour, the longer and more oblong lobes of the stipules, and the much smaller fruiting urceole crowned with shorter connivent calyx-teeth. The new plant shows a decided preference for acid, especially sandy, soils. It has already been recognized in both portions of our area. Mr. Walters cites it from Keynsham, **S.**, 1922, *H. S. Thompson.* On the Gloucestershire side it was found last May on the Millstone Grit outcrop on Clifton Down, **G.**, *N.Y.S.*; and on Yate Common, **G.**, in 1916, by *Miss I. M. Roper* (see her specimens in the herbarium of Leeds University). It is likely to prove common on the Pennant Sandstone of our area, but absent from the Carboniferous Limestone and the Oolites. The genus *Aphanes* (Parsley Pierts) is well distinguished from *Alchemilla* by the annual habit and excellent characters of the androecium.

Bupleurum tenuissimum L. Salt-marshes, Portbury Wharf, **S.** Known to us in this locality since 1914, and still there (*Miss Lewis*).

Antennaria dioica L. has unfortunately been destroyed in its locality in the rough, limestone pasture at Failand, **S.** (see *Journ. Bot.* 1918, p. 43), by the ploughing up of the field some years ago.

Hieracium maculatum Sm. Quarry, Moon's Hill, N. of Stoke Lane, **S.**, *C.I.S.*

Veronica Chamaedrys L. A form with greyish-white flowers in Shipham Bottom, **S.**, *C.I.S.* and *N.Y.S.*

Parentucellia viscosa (L.) Caruel (*Bartsia viscosa* L.). This has survived in greatly diminished quantity on Durdham Down, **G.** *Mr. H. O. Edmonds* saw mostly stunted specimens, which withered very quickly. With the closing of the new turf this species is not likely to continue long in this locality. A similar station has recently been discovered on a common in W. Norfolk.

Rhinanthus major Ehrh. In spite of at least three independent records, the occurrence at any time of this species on the Somerset peat moor needs confirmation. A plant referred by Rev. E. S. Marshall to var. *platypterus* Fr. was said to be abundant there in 1915, and Mr. Marshall also reported a hybrid with *R. minor*, see Mr. White's note in *Journ. Bot.* 1918, p. 47, with references to those of Marshall. Mr. Cedric Bucknall, however, was doubtful of the identification, while Messrs. C. E. Salmon and G. C. Druce definitely rejected it, the latter referring Marshall's var. *platypterus* to *R. Crista-galli* L. var. *robustus* Druce, var. nov. in *B.E.C.* 1921 Rep. p. 300 (1922), while previously in a private letter to the senior writer he had pointed out how the corolla of robust Somerset peat moor and Dorset plants differed from that of *R. major*. Nevertheless, the continental botanist R. von Soó identified two sheets in C. E. Salmon's herbarium of Marshall's gathering no. 4201 from Edington Junction (distributed by Marshall himself as *R. major* var. *platypterus*) as *major* ssp. *aestivalis* (Zinger) Soó and *major* ssp. *montanus* (Sauter)—the latter = *R. major* ssp. *serotinus* (Schönheit) Soó—respectively. This was reported by Mr. A. J. Wilmott in his recent paper on British *Rhinanthus* (*B.E.C.* 1939–40 Rep. pp. 376, 377), with the comment, " The specimens are identical ". The junior writer has recently examined the sheet of *Marshall* no. 4201 in the Kew Herbarium and is in complete agreement with Salmon's remarks in *B.E.C.* 1915 Rep. p. 362 : he finds that the corolla is that of *R. minor*, and wholly lacks the distinctive characteristics (well summarised by Mr. Wilmott) of that of *R. major*. The specimen was gathered on August 23, 1915, and is typical of late-flowering forms of *R. minor* : the main axis is in full fruit and bereft of leaves in the upper half, while from the lower half arise numerous, long, leafy axillary shoots, with short, narrow leaves suggesting some forms of *R. stenophyllus*, and terminated by inflorescences with flowers and young fruits. We have repeatedly found such plants on the peat moors in late summer, often on the borders of hay-fields or the banks of rhines. On the other hand, in nearly 40 years of exploration of these moors, we have never seen any *Rhinanthus* remotely suggesting the true *R. major*, such as we have collected on the coast of Angus (an Angus plant collected by Dr. Druce was referred by Soó to ssp. *polycladus* (Chabert) Zinger). We must add that Mr. Wilmott, in the paper cited above, remarked that he himself had not yet made any intensive study of British *R. major* : he commented on the fact that Soó, in a paper on Central and S.E. European species of *Rhinanthus*, published in 1929, had omitted Britain from the areas of distribution assigned to both ssp. *serotinus* and ssp. *polycladus* ; while, of Marshall's N. Somerset gathering of the supposed hybrid (no. 4371, Edington Junction, July 6, 1916), he wrote, " The determination seems possibly correct ". As Dr. Druce wrote to us, and as Mr. Wilmott has since pointed out, the tooth of the upper corolla lip of British forms of *R. minor* is normally bluish-violet, not white, a feature which brings them under f. *vittulatus* (Gremli) : Marshall probably did not realise this, and may have been partly influenced by this character in determining his supposed hybrid.

R. stenophyllus (Schur.) Druce. Abundant in a hay-meadow between Beryl and West Horrington, near Wells, **S.**, 1946, *J. P. M. Brenan.* Mr. A. J. Wilmott commented on this gathering : " This seems to be the narrow-leaved damp-meadow plant which has been called *R. stenophyllus*. One usually finds broad-leaved plants with it." Apparently a first record for the Somerset side of our area.

Mentha Pulegium L. Side of farm lane leading to Walton Bay from the upper Portishead-Clevedon road, **S.**, *I. W. Evans.* The only previous records were from Wrington (see *Journ. Bot.* 1918, p. 47), and a casual occurrence at Bedminster.

Ajuga reptans L. With white flowers in Rowberrow Bottom, **S.**, *C.I.S.* and *N.Y.S.*

× *Equisetum litorale* Kühlew. (*E. arvense* L. × *limosum* L.). Shipham Bottom, on Mendip, **S.**, July, 1940, *J. P. M. Brenan.* New to the district and to N. Somerset. Mr. Brenan's specimens were passed by Mr. A. H. G. Alston in 1946. When we visited the locality last May (1949) we found a large quantity of the hybrid growing by itself in open swampy ground, while *E. limosum* was noted in a bog a little higher up the valley. The hybrid showed considerable variability, and many of the stems, some of them naked, others with branches, bore cones of varying size. Mr. Peter Taylor, of Kew, who reaffirmed the identification, found that most of the spores in the material he examined were small and colourless, without elaters ; the rest, which were green, had small and twisted elaters.

Chara vulgaris L. var. *papillata* Wallr. Nailsea Moor, **S.**, 1948, *C.I.S.* Published as a new county record in *Watsonia*, i. part iv. p. 262, but it was certainly not so : several N. Somerset records of this variety are given in White's *Flora*, including one from the adjoining Tickenham Moor.

Aliens. A number of interesting species were found last year, the more important being listed separately. On the tip by Portway below Sneyd Park, **G.**, those noted by us included *Glaucium phoeniceum* Cr. (*I. W. Evans*), *Saponaria officinalis* L. with both single and double flowers, *Malva parviflora* L. and *M. nicaeensis* All., *Hibiscus Trionum* L., *Bidens frondosus* L., *Carthamus lanatus* L., *Anagallis arvensis* L. var. *caerulea* Lüdi, and *Datura Stramonium* L. At Avonmouth Dock, **G.**, there was *Xanthium spinosum* L., while *Mr. C. C. Townsend* found *Rumex triangulivalvis* (Danser) Rech. fil. still there in 1948 (det. *A. J. Wilmott*). *Mr. I. W. Evans* collected *Abutilon Theophrasti* Medik, *Amaranthus albus* L. and *Setaria verticillata* (L.) Beauv. at Wapping Wharf, Bristol Harbour, **G.** *Mrs. C. H. Cummins* found *Galinsoga ciliata* (Raf.) Blake in Whiteladies Road, Clifton, **G.** (specimen in Mrs. Bell's herbarium) : this is the correct name for the plant we have been calling *G. quadriradiata* R. et P. var. *hispida* (DC.) Thell., see *Watsonia*, i. part iv, pp. 239–241 (1950).

Brassica Tournefortii Gouan. Portishead Dock, **S.**, *C.I.S.*

Brassicella Erucastrum (L.) O. E. Schulz (*Brassica Cheiranthus* Vill.). By and near a railway embankment at Chittening Warth, N. of Avonmouth, **G.**, *C.I.S.* and *N.Y.S.* This species finds no place in the *Flora of Gloucestershire* although it had been collected at Ashley Hill, Bristol, in 1928, the record being published in the *Adventive Flora of the Port of Bristol.*

Trigonella coelesyriaca Boiss. Rubbish-tip by Portway, **G.**, *C.I.S.* and *N.Y.S.* *T. Foenum-graecum* L. and *T. Besseriana* Ser. also occurred on this tip.

Convolvulus stachydifolius Choisy. Rubbish-tip by Portway, **G.**, *C.I.S.*

Solanum rostratum Dun. Rubbish-tip by Portway, **G.**, *C.I.S.* and *N.Y.S.* This beautiful species had not been seen for many years.

Physalis Alkekengi L. Rubbish-tip by Portway below Sneyd Park, **G.**, *C.I.S.* and *N.Y.S.* First record for the Bristol list.

Verbascum Chaixii Vill. Bank by Mangotsfield Station, **G.**, July, 1921, *C. Bucknall* and *N.Y.S.* Still there last summer. Mr. White at one time confused this species with the very dissimilar *V. virgatum*, and it is possible that the 1909 Mangotsfield record (*White*, *Flora*, p. 450) of the latter species should be transferred to *V. Chaixii.* Unfortunately, however, there is no voucher specimen in either *Herb. White* or *Herb. Roper.*

Antirrhinum Orontium L. Rubbish-tip by Portway, **G.**, *C.I.S.* The typical form, new to the alien flora of Bristol. Previously, only the large-flowered var. *grandiflorum* Chav. had been collected on our tips.

Verbena bonariensis L. Rubbish-tip by Portway below Sneyd Park, **G.**, *C.I.S.* New to the Bristol list.

Amaranthus hybridus L. subsp. *cruentus* (L.) Thell. var. *paniculatus* (L.) Thell. Ashton Gate tip, **S.**, Sept., 1935, *C.I.S.* and *J. P. M. Brenan.* Identified by *Dr. A. W. Kloos, Jr.*, of Holland, who is monographing the genus and has revised the determination of all our Bristol specimens. This particular sub-species and its variety were not previously recorded from Bristol.

Chenopodium hybridum L. Rubbish-tip by Portway, **G.**, *C.I.S.* and *N.Y.S.* Conham, **G.**, *I. W. Evans.*

C. Berlandieri Moq. ssp. *Zschackei* Murr. Rubbish-tip by Portway, **G.**, *C.I.S.*, det. *J. P. M. Brenan.*

Bromus unioloides H.B.K. var. *typicus* Zobel f. *aristatus* Jansen et Wachter. Waste ground near Shirehampton, **G.**, *C.I.S.* and *N.Y.S.* Det. *C. E. Hubbard.*

HEPATICS. *Fossombronia caespitiformis* De Not. Track in Leigh Woods, **S.**, Oct., 1947, *Dr. E. W. Jones* and *C.I.S.* New for v.c.6.

Cephalozia media Lindb. The peat moors, Street Heath and Sharpham Moor, **S.**, 1947, *C.I.S.* New for v.c.6.

Cololejeunia Rossettiana (Massal.) Schiffn. On rocks in shade, Blaise Castle Woods, **G.**, *N.Y.S.* New for district 5 of Gloucestershire.

FLORA OF DENNY ISLAND. Mrs. B. Welch has kindly sent us the following interesting note : " On August 18th and 19th, 1949, F. B. A. Welch and G. A. Kellaway (Geologists) were permitted to accompany the Port of Bristol Authority Surveyor to Denny Island. It is a steep-sided, flat-topped limestone rock about 80 yards long by 23 yards wide at its middle, the surface being about 15 feet above High Water Mark. The flat top is covered with 1 to 2 feet of springy brown peaty soil supporting long coarse fescue grass and many spectacular tree mallows (*Lavatera arborea*) which, even in this abnormally dry season, reached 6 feet in height and were full of flower. The only other plants collected were *Crithmum maritimum*, *Senecio squalidus*, *Taraxacum* sp., *Sonchus oleraceus*, *Plantago maritima*, *Beta maritima*, *Atriplex hastata* and *Rumex crispus*. L. H. Matthews, who visited Denny in 1922 and 1932, did not mention the occurrence of the *Senecio*, *Sonchus*, *Beta* or *Atriplex* in his paper in *Proc. B.N.S.*, 1932, 371–378."

Mr. White remarked (*Flora*, pp. 11 and 204) that Denny Island was in the county of Bristol, while it is treated as part of Gloucestershire in the new Flora of that county. Nevertheless, it has now been established by Messrs. W. R. Price, H. H. Davis and J. E. Dandy that the island is in the parish of Magor, in the county of Monmouth. Mr. Dandy also considers that it should be assigned to the Watsonian vice-county 35 (Monmouthshire). Like the ornithologists (see *Proc. B.N.S.*, 1947, p. 229), we feel that the island may still be regarded as part of the Bristol district.

Mr. T. H. Green, who died at Weston, Bath, in January, 1949, was an old friend and companion on many botanical excursions. He was a keen, amateur botanist who came into prominence in 1913 by breaking all the records of the " Wild Flower Society ". He rediscovered many of the rarer plants at the eastern end of the Somerset peat moor, and showed them to Mr. White and ourselves in August, 1914. He had a very good knowledge of the Bath flora, but could rarely be persuaded to contribute records, although he was always willing to show plants to botanists visiting his neighbourhood. One of his best finds was the discovery of *Orobanche major* (*O. elatior*) on the Oolite above Upper Weston, S.

ORNITHOLOGICAL NOTES, BRISTOL DISTRICT, 1949

COMPILED FROM THE REPORTS OF MEMBERS OF THE B.N.S. ORNITHOLOGICAL SECTION

BY H. H. DAVIS, M.B.O.U.

(*Received Feb. 27, 1950. Read in title at General Meeting, March 2, 1950*)

IN presenting these records for 1949, acknowledgment is due to those members, thirty-one in all, who have forwarded their observations, thereby helping to maintain the continuity of this annual report in the *Proceedings*. To publish such observations in entirety is impracticable but, as in former years, an endeavour has been made to include all those which may be considered important.

As usual, attention has been focussed largely on the North Somerset reservoirs, and from Blagdon there are reports of a Gadwall in November ; a Great Northern Diver on frequent occasions (two in November) ; Spotted Redshanks in November ; and a Grey Plover and Sandwich Terns in September ; at the same place so unexpected a visitor as a Green-winged Teal was seen in December. What may be styled the event of the year was the occurrence of a White-winged Black Tern at Barrow Gurney in September, while from Cheddar there are records of Gadwall in February ; a party of over seventy Black Terns, and a Little Tern, in May ; and a Little Gull in March and early April.*

Noteworthy reports from the New Grounds include those of a Spoonbill in October ; a Bittern in December ; a Grey Lag-Goose in January ; a Lesser White-fronted Goose in January and Febuary ; and a small party of the recently described Greenland White-front in November and December. Wader records of special interest from the Severn are of a flock of fifty-two Bar-tailed Godwits off the New Grounds in May ; a Grey Phalarope at the New Grounds in November ; a Wood-Sandpiper at Frampton-on-Severn in August ; and a Kentish Plover at Severn Beach in May.

From other parts of the district there are reports of a Whinchat at Long Ashton as late as early December and a Ruff on the R. Avon in February, and of such unusual visitors as a Hoopoe at Upton Cheney in June ; a Grey Phalarope at Stoke Gifford in October ; and a Stone-Curlew on Sandford Hill, Mendip, in April. Quail were heard and seen at Pucklechurch in May and at Marshfield, on the Cotswolds, in June.

* For additional reservoir records of special note see Great Snipe (p.36)

Among breeding records, particular mention may be made of the successful nesting of Ravens at each of the four occupied eyries and of Song-Thrushes nesting at Chew Magna so exceptionally early as the last week of January. Special mention may also be made of the breeding of Tree-Sparrows at Stoke Gifford, Wood-Larks at Long Ashton and Grasshopper-Warblers in the Leigh Woods area. Duck observations from Blagdon reservoir provide conclusive evidence of the breeding of four species—Mallard, Garganey, Shoveler and Pochard, only the last named being unsuccessful in bringing off young.

The systematic notes below differ from those of previous years in that the use of trinomials in scientific names has, with a few exceptions, been discontinued. This is in conformity with what seems likely to become a customary practice, and, on so important a matter, Mr. B. W. Tucker's article on species and sub-species in the May–July issues of *British Birds*, Vol. XLII, should be consulted. Unless otherwise stated, all records refer to 1949 and are the result of observations by the following members :—R. E. Alley, B. J. Bailey, A. E. Billett, Rev. F. L. Blathwayt, H. J. Boyd, L. F. Burroughs, Miss K. M. Cary, Miss G. G. Clements, P. J. Chadwick, G. E. Clothier, H. H. Davis, H. Dunnicliff, N. J. Durrant, P. S. Gale, R. G. Hamilton, W. D. Harrisson, B. King, G. A. Knight, A. C. Leach, H. W. Neal, T. H. Payne, R. H. Poulding, Peter Scott, R. A. Skinner, W. R. Taylor, M. Tucker, Rev. G. C. W. Wallis, Miss C. A. L. Wareham, Miss F. Wareham, H. F. Webb and M. J. Wotton. Observations are followed throughout by the appropriate initials.

Thanks are due to Mr. M. J. Wotton for assistance in checking the records in MS. and for making various important corrections.

G = South Gloucestershire **S** = North Somerset

RAVEN *Corvus corax*

G. Again bred successfully Glos. side Avon Gorge (R.H.P., R.A.S., W.R.T.). One near Frenchay, Oct. 8 (M.T.), and three together, Sea Mills, Sept. 3 (R.H.P.).

S. Four young reared, Brean Down (E. G. Holt per H.H.D.). Also bred successfully, Sand Point and Steep Holm (R.H.P., M.J.W.). Seen, singly or in twos, Burrington Combe, Feb. 22 (M.J.W.) ; Cheddar, Apr. 16 (B.K.) ; Abbots Leigh, Nov. 13 (G.G.C.). Up to three, Long Ashton, various dates, July–Dec. (G.E.C.).

CARRION-CROW *Corvus corone*

S. Never less than eighty during frequent counts, winter and summer, Bath Sewage Farm, Saltford. Maximum—126, Dec. 3 (B.K.).

MAGPIE *Pica pica*

G. One, Dec. 15, Durdham Down, Clifton, where the bird is by no means common (R.H.P.).

S. One, Steep Holm, May 22, June 25 (B.K., R.H.P.) ; two, same place, Sept. 24 (M.J.W.) : first records for the island.

STARLING *Sturnus vulgaris*

G. The enormous roost at Winterbourne (cf. *Proc. B.N.S.*, 1948) broke up during March and did not re-form in the autumn (H.H.D.). By late Oct., however, considerable numbers had re-occupied their previous quarters at Old Wood, Rangeworthy, and by late Dec. the roost had assumed immense proportions (J. H. Harford per H.H.D.).

HAWFINCH *Coccothraustes coccothraustes*

S. Bred as usual, Leigh Woods area. Four nests located (P.J.C.).

GREENFINCH *Chloris chloris*

S. A bird, ringed at New Grounds, Glos. (date not recorded) recovered, Long Ashton, Dec. 26 (G.E.C.).

SISKIN *Carduelis spinus*

S. Single bird, Failand, Jan. 22 (G.G.C.) ; party of nine, Blagdon, Mar. 12 (R.H.P.), and another of seven, Saltford, Dec. 4 (D. Taylor per B.K.). Twenty in Alder plantation, Barrow Gurney reservoirs, Jan. 3 (M.J.W.), and up to 24 reported, same place, various dates early Nov. to end of year (G.E.C., P.J.C., R.A.S.).

LESSER REDPOLL *Carduelis flammea cabaret*

S. Records include four, Saltford, Dec. 4 (D. Taylor per B.K.) ; three, Barrow Gurney, 13th (J. C. Leach per H.H.D.).

LINNET *Carduelis cannabina*

S. A bird ringed Long Ashton, Feb. 6, was caught by a cat, Wadebridge, Cornwall, June 19 (G.E.C.).

CORN-BUNTING *Emberiza calandra*

G. Continues to be plentiful in Marshfield area. Six or seven in song, June 19 (A.E.B., R.H.P.).

S. One in full song near Brean Down, July 17 (R.H.P.). One, Long Ashton, Nov. 25 (G.E.C.).

CIRL BUNTING *Emberiza cirlus*

G. Pair or two, Clifton area, in breeding season (R.H.P.). One, near Frenchay, Nov. 19, Dec. 10 (M.T.). Heard, Henbury, as late as Dec. 29 (M.J.W.).

S. Single bird near Cleeve, Apr. 2 (M.J.W.). Two, near Brean Down, July 16 (R.H.P.). Two, Cheddar, July 24; party of six on reservoir path, same place, Oct. 15 (B.K.).

SNOW-BUNTING *Plectrophenax nivalis*

G. One on river-bank between Aust and Littleton-on-Severn, Jan. 2 (H.W.N.).

S. Single birds, Lansdown, Feb. 9 (F.L.B.); Clevedon, Oct. 23 (R.H.P.). Two, Weston-super-Mare, Nov. 6 (R.H.P.).

TREE-SPARROW *Passer montanus*

G. Three or four pairs breeding in orchard trees, Little Stoke Farm, Stoke Gifford, May-July (H.H.D., P.S.G.). Several birds, Wotton-under-Edge, Oct. 30 (H.F.W.).

S. Frequently seen, Saltford, late Oct. to end of year. Largest number—45, Dec. 27 (D. Taylor and B.K.). Two or three, Kewstoke, Nov. 27 (B.K., R.H.P.).

WOOD-LARK *Lullula arborea*

G. Two, Wotton-under-Edge, Apr. 22; one, same place, 26th (H.F.W.). One overhead between Patchway and Stoke Gifford, Oct. 29 (H.H.D.).

S. Single birds, Cheddar, Apr. 10 (R.H.P.), Dec. 12 (M.T.). Heard, same place, Apr. 17, Oct. 15 (B.K.). Two, Backwell Hill, various dates, Sept.–Dec. (R.H.P.). Nest, with five fledged young, Long Ashton, May 18 (G.E.C.).

ROCK-PIPIT *Anthus spinoletta*

S. Twice met with inland—single birds, Cheddar reservoir, Oct. 9 (B.K.), Dec. 12 (M.T.).

WHITE WAGTAIL *Motacilla alba alba*

S. One, still in spring plumage, clearly identified, Cheddar reservoir, Oct. 9 (B.K.).

BLUE TIT *Parus caeruleus*

S. The following seen on Steep Holm—one, Apr. 15; small party, June 27; two or three, Sept. 24. No previous record for the island (R.H.P., M.J.W. *et al.*).

RED-BACKED SHRIKE *Lanius collurio*

S. Single birds, Clevedon, Apr. 18 (M.T.); Publow, May 14 (C.A.L.W., F.W.).

PIED FLYCATCHER *Muscicapa hypoleuca*

G. One, a male, near Frenchay, June 6 (M.T.). Several, perhaps a family party, Wotton-under-Edge, various dates, Aug. 26 to Sept. 4 (H.F.W.).

GRASSHOPPER-WARBLER *Locustella naevia*

G. Heard, North Nibley, various occasions, Apr. 19 to second half of July (H.F.W.). One, Hawkesbury Common, May 15 (R.H.P.).

S. Noted in felled area, Leigh Woods, several dates Apr. (A.E.B., B.J.B., M.J.W.). Two seen, and nest with six eggs located, same place, May 20 (P.J.C.).

LESSER WHITETHROAT *Sylvia curruca*

G. One, evidently on passage, seen and heard, south-west corner College Close, Clifton, May 10 (W.R.T.).

SONG-THRUSH *Turdus ericetorum*

S. As reported in *Western Daily Press*, nest with four eggs found in garden at Chew Magna on the extremely early date of Jan. 25. The nest was seen on Feb. 2 by T.H.P., who states that incubation was then in progress and that, despite a thermometer reading of 11° frost on Feb. 4, four young were hatched on or about 12th. The same observer records that all the young were reared.

BLACKBIRD *Turdus merula*

G. A white bird observed in Pembroke Road area, Clifton, various occasions early Oct. to end of year (W.D.H.). What was, no doubt, this bird was seen same area, Dec. 31, by P.J.C., who describes it as a male albino, with plumage entirely white, legs pale pink and bill orange-yellow.

WHEATEAR *Oenanthe oenanthe*

G. One, considered to be of the British race (*Oe. oe. oenanthe*), at New Grounds as late as Nov. 29 (H.J.B.).

WHINCHAT *Saxicola rubetra*

S. One visited Long Ashton Research Station on autumn passage and remained until the exceptionally late date of Dec. 8. It then appeared to be ailing and was not seen subsequently (G.E.C.)

STONECHAT *Saxicola torquata*

G. Autumn and winter records as for N. Som. (see below). No. breeding information.

S. Reported in autumn or winter from a number of widely separated localities (various observers), but the only notice of breeding, the first for the district since the severe weather of 1947, is of two pairs nesting successfully, Brean Down (E. G. Holt per H.H.D.).

BLACK REDSTART *Phoenicurus ochrurus*

G. Single birds, female or immature, Cumberland Basin, Jan. 16 (R.H.P.), Henleaze, mid-Oct. (M.T.).

S. Adult male, Sand Point, Apr. 2 (R.H.P.), another, Long Ashton, Nov. 2 (G.E.C.). Single, female or immature, birds, Long Ashton, Oct. 24, Barrow Gurney, 30th (G.E.C., P.J.C.). Continues to occur regularly in winter on Brean Down (E. G. Holt per H.H.D.)

DIPPER *Cinclus cinclus*

G. One, R. Frome, Stapleton, Nov. 25 (M.T.).

S. One, Iford Manor, nr. Bath, June 4 (R.G.H.).

SWALLOW *Hirundo rustica*

G. A white bird, apparently immature and entirely white apart from slight, buffish tinge on breast, seen between Patchway and Stoke Gifford, Sept. 23 (H.H.D.). A Swallow, described as being pure white (perhaps same bird), reported in *Thornbury Gazette* as being seen at Downend, Sept. 26.

SWIFT *Apus apus*

S. Two, Blagdon reservoir, as early as Apr. 19 (M.J.W.).

NIGHTJAR *Caprimulgus europaeus*

S. Reported, a pair or two, Leigh Woods area in breeding season (R.G.H., R.H.P., R.A.S.). Single birds, Cadbury Camp, Aug. 7, top of Cheddar Gorge, 11th (A.C.L.).

HOOPOE *Upupa epops*

G. On June 5 a Hoopoe visited lawn at Upton Cheney House, where it remained for a short while and was stalked and photographed (J. P. Middleton per H.H.D.).

LESSER SPOTTED WOODPECKER *Dryobates minor*

G. Heard or seen, Mangotsfield, Feb. 19 (M.T.) ; Berkeley, July 17 (H.H.D.) ; Bitton, July 31 (B.K.) ; Tortworth, Oct. 8 (F.L.B.) ; Frenchay, Nov. 19 (M.T.) ; and frequently at Dyrham and Stoke Gifford (F.L.B., H.H.D.).

S. One, Blagdon, Mar. 26, Apr. 15 (B.J.B., B.K., M.J.W.).

SHORT-EARED OWL *Asio flammeus*

S. Single bird, Yeo Estuary, Jan. 29 (R.H.P.).

PEREGRINE FALCON *Falco peregrinus*

G. One, Aust Cliff, Jan. 2, 4 (H.W.N., H.H.D.), and one, harrying Wood-Pigeons, Dyrham Park, Feb. 13 (Justin Blathwayt per F.L.B.). Single bird, Avon Gorge, Sept. 3 (R.H.P.). Frequent, usually one but sometimes two, New Grounds, early in year and again Oct.–Dec. (P.S., H.H.D. *et al.*).

S. One, Steep Holm, several dates in spring, but no evidence of breeding. Two, same place, Sept. 24 (R.H.P., M.J.W.).

MERLIN *Falco columbarius*

G. Pair, near Wotton-under-Edge, several dates Apr. 19 to mid-May (H.F.W.).

S. Two, Dolebury Warren, Mendip, Sept. 24 (A. G. Tayler per N.J.D.).

COMMON BUZZARD *Buteo buteo*

G. Two, Wotton-under-Edge, various dates May–Oct. (H.F.W.), two near Almondsbury, Aug. 21 (R.A.S.). Single birds, Dyrham Wood, Mar. 29, Oct. 7 (F.L.B.) ; Stoke Gifford, Sept. 26 (H.H.D.) ; New Grounds, Oct. 31 (P.S.) ; Rangeworthy, Nov. 2, 28 (J. H. Harford per H.H.D.).

S. Reported, singly or in twos, Failand, Jan. 2 (R.A.S.) ; Blagdon, Jan. 30, Feb. 27 (B.K.), Aug. 13 (G.G.C.) ; Burrington Combe, Feb. 27 (H.D.) ; Saltford, Mar. 28, Dec. 4 (D. Taylor per B.K.) ; Cheddar, Apr. 15 (B.K.), May 7 (B.J.B., M.J.W.) ; Steep Holm, Apr. 17 (R.H.P., M.J.W.) ; Bleadon Hill, June 7 (B.J.B.) ; Brockley Combe, Dec. 4 (R.H.P.) ; Backwell Hill, Dec. 11 (R.H.P.). Reported also from Axbridge, and from Langford where a pair may have bred (N.J.D.). Breeding suspected in Failand area where three seen several dates August (A.C.L., and J. C. Leach per H.H.D.).

SPARROW-HAWK *Accipiter nisus*

S. A female, Steep Holm, Sept. 24 : first record for the island (M.J.W.).

SPOONBILL *Platalea leucorodia*

G. Brief but clear views obtained of one on sand-banks off New Grounds, Oct. 29 (J. M. Browne per H.H.D.). Only two previous records for the Severn (cf. *Proc. B.N.S.*, 1947, p. 246).

COMMON HERON *Ardea cinerea*

S. Twenty-four occupied nests, Brockley Combe Heronry, Apr. 24 (B.K., G.A.K., M.J.W.).

BITTERN *Botaurus stellaris*

G. One seen, New Grounds, Dec. 30 (H.J.B.).

GREY LAG-GOOSE *Anser anser*

G. Immature bird, New Grounds, Jan. 15 to 23 or later (P.S.).

WHITE-FRONTED GOOSE *Anser albifrons*

G. Peak total at New Grounds early in year—3,800 (P.S.). Apart from a single bird, Sept. 25, first autumn arrivals were eighteen, Oct. 2. Number considerably less than usual, reached

780 by Dec. 31 (P.S.). A family party of five (2 ad. and 3 juv.), dark plumaged, yellow-billed birds seen frequently, Nov. 9 to end of year, were clearly identified by P.S., H.J.B., H.H.D. *et al.* as being of the recently described Greenland race *A. a. flavirostris* (cf. *Bull. B.O.C.*, Vol. 68, No. 6). A White-front ringed at New Grounds, Feb., 1948, was shot in Zeeland, Holland, Jan. 7 (*Rep. Severn Wildfowl Trust*, 1948–49, p. 7).

S. A single adult in field adjoining Barrow Gurney reservoirs, Jan. 16 (G.E.C.).

LESSER WHITE-FRONTED GOOSE *Anser erythropus*

G. An adult male first noticed at New Grounds, Dec. 20, 1948, remained until Feb. 13 or later (*Rep. Severn Wildfowl Trust*, 1948–49, pp. 5 and 6).

BEAN-GOOSE *Anser fabalis fabalis*

G. One, immature, among White-fronts, New Grounds, Feb. 13, was not seen subsequently and appears to have remained for one day only (P.S.).

PINK-FOOTED GOOSE *Anser fabalis brachyrhynchus*

G. Several among White-fronts, New Grounds, early in year. Autumn arrivals, a party of 31, first seen Oct. 1. Number reached 62 by Oct. 16 but dwindled to not more than 30 in late Nov., and by late Dec. only seven remained (P.S.).

BARNACLE-GOOSE *Branta leucopsis*

G. Single bird, New Grounds, Nov. 5 to end of year (P.S.).

SHELD-DUCK *Tadorna tadorna*

S. Reported from reservoirs—one, Barrow Gurney, June 11 (M.J.W.), three, Cheddar, Nov. 10, two, Blagdon, 20th (B.K.). Counts of 150, Brean Sands, July 16, and 175, Sand Bay, Nov. 27 (R.H.P.).

MALLARD *Anas platyrhyncha*

G. Largest number reported from New Grounds—1,000, Jan. 22 (B.K.).

S. Maximum count at reservoirs—430, Blagdon, Oct. 15 (B.K.). At least 300, Sand Bay, Nov. 27 (B.K.).

GADWALL *Anas strepera*

G. Two visited Severn Wildfowl Trust's pens, Oct. 31. They remained and were seen on various occasions later (P.S.).

S. Pair, Cheddar reservoir, Feb. 28 (B.K.), and a male, Blagdon reservoir, Nov. 7 (M.T.).

TEAL *Anas crecca crecca*

G. Total of 100, New Grounds decoy, Sept. 26 (P.S.). Highest number seen in Estuary, New Grounds—1200, Jan. 22 (B.K.).

S. Maximum count at reservoirs—600, Blagdon, Dec. 1 (B.K.).

GREEN-WINGED TEAL *Anas crecca carolinensis*

S. Adult male among common Teal, Blagdon reservoir, Dec. 18. Viewed with telescope at fifty yards' range, when the following characters as compared with males of *A. c. crecca* were noted—white, vertical breast-band immediately fore of the wing; absence of white, horizontal band above wing; ill-defined and scarcely perceptible creamy-white line separating chestnut crown from green eye-band; warmer ground-colour of lower breast (B.K. and D. Taylor). No previous record for the district or for County of Somerset, and, as P.S. reports all captive Green-winged Teal in the British Isles as being permanently pinioned, it seems evident that the bird was a genuinely wild visitor.

GARGANEY *Anas querquedula*

G. One caught, New Grounds decoy, Aug. 21, and single birds seen, same place, Sept. 4, 25 (P.S.).

S. Pair, Kenn Moor, three occasions, May 8–10 (L.F.B., G.E.C.). Up to half a dozen frequently noted, spring and summer, Blagdon reservoir, where two pairs nested, thus providing the first conclusive evidence of breeding in N. Somerset. Nest with ten eggs, another with five, both May 8 (A.E.B., H.D.). Female and young seen, various dates June–July (B.K., M.J.W., H.H.D.). Most reports refer to a female and one duckling, but M.J.W. records female and four ducklings, June 6. Autumn records of Garganey at Blagdon are of three, Aug. 10 (M.J.W.), six, Aug. 21 (B.K.), one, Sept. 4 (D. Taylor per B.K.).

WIGEON *Anas penelope*

G. Forty-one, New Grounds decoy, Sept 25 (P.S.). Highest number reported from Severn Estuary—800, New Grounds, Nov. 8 (H.J.B.). Count of 190 off Severn Beach, Dec. 29 (M.J.W.).

S. Maximum count at reservoirs—588, Blagdon, Jan. 10 (B.K.).

PINTAIL *Anas acuta*

G. Fifteen, New Grounds, Jan. 2 (M.J.W.), 65, same place, 22nd (B.K.). Thirty-two, New Grounds decoy, Sept. 26 (P.S.).

S. Up to eight, Blagdon reservoir, various dates Sept.–early Dec. (B.K.). Twice noted Cheddar reservoir—two, Jan. 5 (M.J.W.), party of six, Nov. 6 (B.K.).

SHOVELER *Spatula clypeata*

G. Thirty off New Grounds, Jan. 22 (B.K.). Thirty-two, New Grounds decoy, Nov. 22 ; fifty-three, same place, Dec. 4 (P.S.).

S. Largest count at reservoirs—156, Cheddar, Jan. 2 (R.H.P., B.K.). A pair bred successfully at Blagdon. Nest with sitting bird reported in early May, and female with recently hatched young disturbed in dense reed bed, June 4 (H.D.). Female and five well grown young seen by B.K., July 24.

COMMON POCHARD *Aythya ferina*

G. Single bird, New Grounds decoy, Dec. 3, 31 (P.S.).

S. Maximum counts at reservoirs—850, Blagdon, Jan. 10, and 867, same place, Nov. 20 (B.K.). Combined total, Blagdon and Cheddar, Jan. 2, was little short of 1100 (B.K.). Pair bred, unsuccessfully, at Blagdon. Nest with eight eggs seen, June 4, 11 (H.D., M.J.W.), but on 18th M.J.W. found eggs broken and nest deserted.

TUFTED DUCK *Aythya fuligula*

G. Female, New Grounds decoy, Nov. 1 (P.S.).

S. Total of 158 at Blagdon, Oct. 23, recorded by B.K. as being maximum count at reservoirs, but A.C.L. and J. C. Leach report the exceptionally high number of 500, same place, Dec. 23.

SCAUP *Aythya marila*

S. Single males, Barrow Gurney reservoirs, Apr. 23 (G.E.C.), Dec. 13 (J. C. Leach per H.H.D.), and pair, same place, Nov. 13 (R.H.P.). Cheddar records are of single, female or immature, birds, Jan. 2 (R.H.P.) ; various dates Mar. (B.K.) ; Apr. 3 (H.H.D.) ; Nov. 6 (B.K.). A female, Blagdon, Mar. 20 (B.K.). Four pairs, Sand Bay, Nov. 11, 27 (R.H.P., B.K.).

GOLDENEYE *Bucephala clangula*

S. Frequently seen at reservoirs, Jan.–Mar. and late Oct. to Dec. Largest numbers reported were fifteen, Blagdon, Jan. 10 (B.K.). and twenty, including six adult males, Cheddar, Dec. 31 (M.J.W.). One adult male still present, Blagdon, May 7 (M.J.W.).

COMMON SCOTER *Melanitta nigra*

S. Adult female found dead, Blagdon reservoir, Jan. 22 (B.J.B., M.J.W.). Adult male found dead, same place, Mar. 6 (B.K., R.H.P.).

GOOSANDER *Mergus merganser*

S. Up to five frequently seen, Cheddar reservoir, Jan. to early Apr. and in Dec. Chiefly red-headed birds but adult male present on various occasions (B.K., R.H.P., M.J.W.). Pair, Blagdon reservoir, Dec. 26 (B.K., H.H.D., M.J.W.).

SMEW *Mergus albellus*

S. The following, all red-heads, seen at reservoirs—one, Cheddar, Jan. 2, 5 (R.H.P., M.J.W.), six, Blagdon, Feb. 27, Mar. 8 (B.K., H.H.D.).

CORMORANT *Phalacrocorax carbo*

S. Twenty-three occupied nests, Steep Holm, Apr. 15, May 22 (R.H.P., M.J.W.).

GREAT CRESTED GREBE *Podiceps cristatus*

S. Six nests with eggs located, Blagdon reservoir, during summer (B.K.).

SLAVONIAN GREBE *Podiceps auritus*

S. Two watched by M.J.W. at Cheddar reservoir, Jan. 5, were engaged in display which has not, apparently, been previously recorded for the species in winter (cf. *British Birds*, Vol. XLII, p. 296). Single bird, Barrow Gurney reservoirs, Sept. 18 (B.K.).

BLACK-NECKED GREBE *Podiceps nigricollis*

S. One seen, Barrow Gurney reservoirs, several dates early Sept. (M.J.W.), and one reported from Cheddar reservoir on two or three occasions, Sept. 18 to Oct. 25 (B.K.).

GREAT NORTHERN DIVER *Colymbus immer*

S. Single bird seen, Blagdon reservoir, several occasions Apr. (B.K., H.H.D., G.C.W.W.) and various dates, Nov. 13 to end of year (A.C.L., P.J.C., R.A.S.). Two, same place, Nov. 20 (P.J.C.).

TURTLE-DOVE *Streptopelia turtur*

S. Two young ringed from nest in Leigh Woods, July 6 (R.H.P.).

BAR-TAILED GODWIT *Limosa lapponica*

G. Two, New Passage, May 12 (M.J.W.); seven, all males in red plumage, same place, 14th (B.J.B.). Party of 52, the largest number yet recorded for Severn Estuary, off New Grounds, May 14 (M.J.W.).

BLACK-TAILED GODWIT *Limosa limosa*

G. Only notice is of single bird off New Grounds, Aug. 17 (M.J.W.).

WHIMBREL *Numenius phaeopus*

S. Spring records include those of a party of 24, Clevedon, May 8 (D. Taylor per B.K.), and one of twelve in a field at Tickenham, various dates mid-May (G.E.C.). About forty, an unusually large party for an inland locality, were seen together on Kenn Moor, May 1, 1948 (cf. *British Birds*, Vol. XLII, p. 30).

WOODCOCK *Scolopax rusticola*

G. One, Wotton-under-Edge, Mar. 30. Seen, same locality, various occasions, Oct.–Dec. (H.F.W.).

GREAT SNIPE *Capella media*

S. A large snipe, undoubtedly *C. media*, flushed three times in quick succession, Blagdon reservoir, Mar. 6 (B.K., R.H.P.), and another (possibly the same) put up a dozen times within an hour at clay-pits adjoining Cheddar reservoir, Apr. 3 (B.K.). Details from B.K. show that on all occasions the bird rose silently, alighting again almost immediately, and appeared larger than Common Snipe (*C. gallinago*), some of which were present on each date, and was noticeably slower and more direct in flight. At both Blagdon and Cheddar the conspicuously white outer tail-feathers were noted but only at the former was it possible to detect so important a character as the heavily barred flanks. The Blagdon bird, when viewed at 50 yards' range near the water's edge, was seen to waddle into cover with the half-walking, half-running gait described in *The Handbook* (Vol. IV, p. 193).

JACK SNIPE *Lymnocryptes minimus*

S. Up to three reported frequently from Saltford, early Jan. to late Mar. (D. Taylor per B.K.). One, Kenn Moor, Dec. 31 (M.T.).

GREY PHALAROPE *Phalaropus fulicarius*

G. Twice seen on flooded pastures, Stoke Gifford—one, Oct. 21 (J. C. Walker per H.H.D.), and one, probably the same, 28th (H.H.D.). One visited New Grounds, Nov. 9, and remained till 17th (P.S.).

TURNSTONE *Arenaria interpres*

G. Three off New Grounds, May 14 (M.J.W.); 100 to 150 twice reported from Severn Beach in early Oct. (M.T., P.J.C.).

S. One, Black Rocks, Clevedon, July 24; four, same place, Oct. 23 (R.H.P.).

KNOT *Calidris canutus*

G. Twice noted on spring passage—two, Severn Beach, May 10 (A.C.L.), one, same place, 21st (M.J.W.). Autumn records include those of ten, New Grounds, Aug. 17 (M.J.W.), twenty, Severn Beach, Sept. 15 (A.C.L.); 104, same place, 19th (M.J.W.).

S. Single bird, Clevedon, July 24 (R.H.P.). One, Cheddar reservoir, Sept. 28; two, same place, Nov. 20 (B.K.).

DUNLIN *Calidris alpina*

G. Partial albino, Severn Beach, Apr. 20 and another off New Grounds, May 14 (M.J.W.).

LITTLE STINT *Calidris minuta*

S. Single bird seen, Blagdon reservoir, three occasions Sept. (R.E.A., A.C.L. *et al.*).

SANDERLING *Crocethia alba*

G. Up to three, Severn Beach, various dates in spring (B.J.B., A.C.L. *et al.*). Twelve, New Grounds, May 14 (M.J.W.). One, Severn Beach, Oct. 2 (M.T.).

S. Single birds, Clevedon, Mar. 27, Aug. 3 (R.H.P., M.T.), Yeo Estuary, Aug. 7 (B.K.). Two, Blagdon reservoir, Sept. 15 (B.K.).

RUFF *Philomachus pugnax*

G. One, New Grounds, Oct. 30 (H.H.D., P.S.).

S. One, R. Avon, Feb. 6—fourth winter record for the district (R.H.P.). Single bird, Blagdon reservoir, various dates, Sept. 9 to Oct. 2 (K.C., C.A.L.W., F.W. *et al.*). Two, same place, Sept. 24 (R.E.A.).

WOOD-SANDPIPER *Tringa glareola*

G. One seen, Frampton-on-Severn gravel pits, just outside the district, Aug. 13, by R.H.P., who obtained close views and has supplied full and conclusive details.

GREEN SANDPIPER *Tringa ochropus*

S. Autumn records from reservoirs include those of three, Blagdon, Aug. 28 (R.E.A.), Sept. 4 (H.H.D.), while the only spring notice is of one, Cheddar, Apr. 9 (M.T., M.J.W.). One near Clevedon, Aug. 21 (R.H.P.). Two Dec. records—single birds, Blagdon reservoir, 23rd; R. Avon, nr. Pill, 27th (A.C.L.).

SPOTTED REDSHANK *Tringa erythropus*

S. Two, possibly three, Blagdon reservoir on the somewhat late date of Nov. 6 (H.H.D., B.K.).

GREENSHANK *Tringa nebularia*

G. Two off New Grounds, Aug. 13 (R.H.P.); three, same place, 21st (H.H.D.).

S. Autumn records include those of four, Blagdon reservoir, Aug. 21 (B.K.); two, same place, Sept. 4 (A.C.L., H.H.D.). Two spring notices—single birds, Barrow Gurney reservoirs, Apr. 13 (B.J.B., M.J.W.); Cheddar reservoir, May 7 (M.J.W.).

KENTISH PLOVER *Leucopolius alexandrinus*

G. A female seen at close range, among Ringed Plover, at Severn Beach, May 10 (A.C.L., W.R.T.) : second record for the district and for County of Gloucestershire (cf. *British Birds*, Vol. XLIII, p. 23).

GOLDEN PLOVER *Pluvialis apricaria*

G. About ninety, New Grounds, Jan. 9, and at least 120, same place, Feb. 19 (R.H.P.). Frequent, up to maximum of 100, New Grounds, Oct. to end of year (H.J.B., H.H.D. *et al.*).

S. Fifty near Keynsham, Jan. 23 (R.H.P.) ; 112, Lulsgate aerodrome, Mar. 8 (B.K.) ; 25, Backwell Hill, Nov. 20 (R.H.P.).

GREY PLOVER *Squatarola squatarola*

G. Single bird, in full breeding plumage, off New Grounds, May 14 (M.J.W.). Two, same place, Nov. 24 (H.J.B.).

S. One, Blagdon reservoir, Sept. 24, 25 (R.E.A., B.K.). One, no doubt the same bird, seen at the reservoir, Oct. 1, by M.J.W., and on 2nd by R.E.A., who saw it in flight and reports that the black axillaries were clearly visible : first inland record for the district. Single bird at mouth of R. Avon, Dec. 22 (A.C.L.).

LAPWING *Vanellus vanellus*

S. A bird ringed at Riga, Latvia (date not yet known) was found dead at Pill, about late Nov., 1948 (R.H.P.).

OYSTER-CATCHER *Haematopus ostralegus*

S. Up to sixty or more, Weston-super-Mare and Brean Sands, various occasions, July–Nov. (R.H.P., M.T.). Reservoir records are of single birds, Blagdon, Aug. 15, Dec. 4 (B.K., P.J.C.), and two, Barrow Gurney, Oct. 15 (M.J.W.).

STONE-CURLEW *Burhinus oedicnemus*

S. Clear views obtained of one on Sandford Hill, Mendip, Apr. 2 (N.J.D.) : first record for the district for nearly 25 years (cf. *Proc. B.N.S.*, 1947, p. 261).

BLACK TERN *Chlidonias niger*

S. One spring record—seventy or more, the largest number yet seen together at the reservoirs, counted at Cheddar, May 12 (M.J.W.). Single birds, sometimes two or three, reported from Barrow Gurney, Blagdon and Cheddar, various dates Sept. (R.E.A., G.E.C., A.C.L. *et al.*). One, Cheddar, as late as Oct. 23 (B.K.).

WHITE-WINGED BLACK TERN *Chlidonias leucopterus*

S. An adult in moult was seen, hawking with two immature Black Terns, over No. 2 reservoir, Barrow Gurney, Sept. 9 (M.J.W., H.H.D.), 10 (G.E.C., A.C.L., R.H.P.). Excellent views obtained on both dates, and among important details noted were—head white, with small dark mark behind eye and black flecks on crown and nape ; mantle and back black, mottled slate-grey, contrasting sharply with white rump and white, square-ended tail ; axillaries and under-wing coverts black ; breast and belly jet black, heavily blotched white : first record for the district and for County of Somerset (cf. *British Birds*, Vol. XLIII, pp. 161-2).

SANDWICH TERN *Sterna sandvicensis*

S. Two identified, Blagdon reservoir, Sept. 11, by R.E.A., who has supplied conclusive details.

COMMON TERN *Sterna hirundo* ARCTIC TERN *Sterna macrura*

S. Terns, Common or Arctic, seen at the reservoirs on a number of dates in spring, and frequently during autumn passage, which continued into the second half of Nov. (various observers). Species not always determined but Commons identified on several occasions. Highest total reported—twelve, Cheddar, Oct. 23 (B.K.). Arctic Tern found dead at Cheddar, Nov. 20 (B.K.), and remains of another picked up at same place, Dec. 12 (M.T.). One, also an Arctic, found dead, Yeo Estuary, Oct. 10 (R.H.P.).

LITTLE TERN *Sterna albifrons*

S. Clear views obtained of one, Cheddar reservoir, May 7 (B.J.B., M.J.W.).

LITTLE GULL *Larus minutus*

S. An immature bird seen, Cheddar reservoir, various occasions Mar. 13 to Apr. 9 (B.K., H.H.D., M.T., M.J.W.).

BLACK-HEADED GULL *Larus ridibundus*

S. A bird ringed as a nestling near Prague, Czechoslovakia, May 27, 1948, was recovered at Barrow Gurney reservoirs, Nov. 9 same year (G.E.C.)

COMMON GULL *Larus canus*

G. Reported as continuing to roost in great numbers, Frampton Sands, off New Grounds. B.K. records that at dusk on Oct. 2 there were probably not less than 20,000 on sand-banks and many were still pouring in from the Cotswolds.

LESSER BLACK-BACKED GULL *Larus fuscus*

S. At least nine, *Larus f. graellsii*, Barrow Gurney reservoirs, as late as Dec. 27 (R.H.P.).

GREAT BLACK-BACKED GULL *Larus marinus*

S. Occupied nests on Steep Holm, May 22, totalled 33—the largest count yet recorded (R.H.P. *et al.*). Continues to visit reservoirs in increasing numbers, twelve being seen Cheddar, Oct. 15 (B.K.), and twenty-eight, Barrow Gurney, Dec. 27 (R.H.P.).

KITTIWAKE *Rissa tridactyla*

S. One found dead, Portbury Wharf, Feb. 27 (R.H.P.). Twice met with at Cheddar reservoir—one, a dead bird, Mar. 30 (B.K.), one, Dec. 12 (M.T.).

CORN-CRAKE *Crex crex*

S. Heard and seen in rough grass, Blagdon reservoir, May 7 (B.J.B., M.J.W., R.H.P.). Calling heard, Nempnett, June, but no evidence of breeding (T.H.P.).

WATER-RAIL *Rallus aquaticus*

G. Dead bird found, Wotton-under-Edge, Dec. 5 (H.F.W.).

S. Single birds reported from Long Ashton and Blagdon reservoir in Mar. (P.J.C., B.K.). One at clay-pits, Cheddar reservoir, Apr. 9 (M.J.W., M.T.). Up to four at old reservoir, Barrow Gurney, various dates Dec. (A.C.L., M.J.W., and J. C. Leach per H.H.D.).

COOT *Fulica atra*

S. Maximum counts at reservoirs—1620, Blagdon, Jan. 30, and 1410, Cheddar, Nov. 11 (B.K.).

RED-LEGGED PARTRIDGE *Alectoris rufa*

G. Single birds, Dyrham, Mar. 24 (F.L.B.) ; near Cattybrook Farm, Almondsbury, June 6 (H.H.D., M.T.).

QUAIL *Coturnix coturnix*

G. Heard and seen, Pucklechurch, last week May (F.L.B.). Calling heard, and a pair put up, Marshfield, June 19 (A.E.B., R.H.P.).

LEPIDOPTERA NOTES, BRISTOL DISTRICT, 1949

By C. S. H. BLATHWAYT, M.A., Hon. Sec. of the
ENTOMOLOGICAL SECTION

COMPILED FROM REPORTS OF MEMBERS OF THE SECTION

(*Received, Feb. 8, 1950. Read in title to Entomological Section, Feb. 6, 1950.*)

THE Winter of 1948–49 was one of the mildest for many years and early Spring moths began emerging at the end of January. February was unusually dry and there were many fine days in March. Sallow was well out during the latter part of the month but in the writer's experience moths were rather less common than usual at dusk on Sallow catkins. April was on the whole very fine and the weather at Easter extremely good. May was rather a varied month so far as weather was concerned but the Section had a magnificent day for its coach outing to Hod Hill in Dorset on May 21.

The months of June, July and August all produced perfect weather of a quite exceptional nature and, at times, it was almost too hot for proper collecting. Insects, except perhaps those occurring on Downland, were, however, scarcer during these months than usual and this was most noticeable at the Section's Field Day at Wickwar on July 2. The reason for this scarcity may have been the mild Winter.

The fine weather during the Summer made one feel that September should be a good month for migrants and this it, in fact, proved to be. *Colias croceus* was common and many var. *helice* were seen, though not in such profusion as in 1947. *Celerio livornica*, which is, as a rule, an exceptionally rare migrant, was quite common at Weston-super-Mare over Petunias immediately after sunset. *Rhodometra sacraria* was also taken in the Bristol area and eggs were obtained from a female, and moths bred.

In October the fine weather broke and torrential rain and gales occurred for many days in the middle of the month. The end of the month was bleak and cold, though *Colias croceus* still flew on any day when there was some sun. Ivy in the Autumn was not as good as in 1948, though more productive than in 1947, and the writer took *Dasycampa rubiginea* right at the end of October.

The records and observations given below are from North Somerset, except when otherwise stated, and are selected from data supplied by the following members of the Section :—Messrs. C. L. Bell (C.L.B.), J. F. Bird (J.F.B.), H. W. Bird (H.W.B.), C. S. H. Blathwayt (C.S.H.B.) and K. H. Poole (K.H.P.).

RHOPALOCERA (Butterflies)

Argynnis paphia Linn. (Silver-washed Fritillary). Several at Wickwar on 2 July.

Euphydryas aurinia Rott. (Marsh Fritillary). Abundant at Wickwar, late May and early June.

Vanessa cardui Linn. (Painted Lady). Very common in late Summer and Autumn.

Limenitis camilla Linn. (White Admiral). Several at Wickwar, 2 July.

Hamearis lucina Linn. (Duke of Burgundy). Several at Wickwar, 28 May and 6 June.

Lycaena phlaeas Linn. (Small Copper). Several minor vars. bred from Bristol stock in the 3rd Brood, including one var. *radiata* (C.L.B.).

Colias Croceus Fourc. (Common Clouded Yellow). Very common in Summer and Autumn, with some var. *helice*, but not as common as in 1947.

Erynnis tages Linn. (Dingy Skipper). Second brood on 30 July (C.S.H.B.).

HETEROCERA (Moths)

Laothoe populi Linn. (Poplar Hawk). A female captured in Aug. laid 80 eggs from which 63 pupae were obtained (C.L.B.).

Mimas tiliae Linn. (Lime Hawk). Many pupae dug up at foot of Lime and Elm trees in Bristol district in Jan. and Feb., from which moths showing considerable variation emerged from Mar. 15 onwards (C.L.B.).

Celerio livornica Esp. (Striped Hawk). 20 seen and 17 taken at Weston-super-Mare, flying over Petunias shortly after sunset Sept. 3/20 (C.S.H.B.).

Deilephila elpenor Linn. (Large Elephant Hawk). 12 July (H.W.B.).

Macroglossum stellatarum Linn. (Humming-bird Hawk). Common in Summer and Autumn (C.S.H.B.).

Hemaris tityus Linn. (Narrow-bordered Bee Hawk). Wickwar, 28 May (C.S.H.B.).

Asphalia diluta Schiff. (Lesser Lutestring). Common at light and sugar in Aug. (C.S.H.B.).

Eriogaster lanestris Linn. (Small Eggar). Several webs of larvae at Wickwar, 6 June (C.S.H.B.).

Lasiocampa trifolii Schiff. (Grass Eggar). 9 small larvae taken on coast near Weston-super-Mare, 30 Apr., from which 4 male and 5 female moths were bred, 4 to 8 Aug. (C.S.H.B.).

Phragmatobia fuliginosa Linn. (Ruby Tiger). 30 April (C.S.H.B.).

Eilema sororcula Hufn. (Orange Footman). 17 June (H.W.B.).

Comacia senex Hubn. (Round-winged Footman). 12 July (H.W.B.).

Apatele rumicis (Dusky Knot-grass Dagger). Several more or less melanic examples, including one var. *salicis* on 6 Aug. (H.W.B.).

Craniophora ligustri Fabr. (Crown). 30 July (C.S.H.B.), 9 July (G. Hugh Bird).

Cryphia muralis Forst. (Marbled Vert). 21 June (K.H.P.).

Euxoa tritici Linn. (White-line Dart). 11 July (H.W.B.).

Lampra fimbriata Schreber (Broad-bordered Yellow-underwing). 30 July (C.S.H.B.).

Hadena conspersa Esp. (Common Marbled Coronet). 17 June (2). (H.W.B.).

H. cucubali Fuessl. (Campion Coronet). 22 May (K.H.P.).

Tholera cespitis Fabr. (Hedge Rustic). 25 Aug. (C.S.H.B.).

Eumichtis lichenea Hubn. (Feathered Ranuncule). At Ivy, Oct. (C.S.H.B.).

Procus literosa Haw. (Rosy Minor). 11 July (H.W.B.).

Apamea sublustris Esp. (Reddish Light Arches). Several 17/29 June (J.F.B., H.W.B.).

A. monoglypha Hufn. (Dark Arches). 2nd generation, 21 Nov. (H.W.B.).

Aporophyla nigra Haw. (Black Rustic). Several at Ivy, Oct. (C.S.H.B.).

Rhizdra lutosa Hubn. (Large Wainscot). 25 Sept. (H.W.B.).

Hydraecia micacea Esp. (Rosy Ear). 26 Aug. (K.H.P.).

Arenostola fluxa Hubn. (Mere Wainscot). 11 July (H.W.B.).

Panolis flammea Schiff. (Pine Beau). 14/17 April (C.S.H.B.).

Cerastis rubricosa Fabr. (Red Chestnut). 26 Mar, 2 April (C.S.H.B.).

Orthosia gothica Linn. (Common Hebrew-character). 24 Feb. at Blagdon—an early date (H.W.B.).

Tiliacea citrago Linn. (Orange Sallow). 6 Sept. (H.W.B.).

T. aurago Fabr. (Barred Sallow). A slightly suffused example 30 Oct. (H.W.B.).

Dasycampa rubiginea Fabr. (Dotted Chestnut). 30 Oct., at Ivy (C.S.H.B.).

Catocala nupta Linn. (Red Underwing). Common at Sugar, Aug. and Sept (C.S.H.B.).

Abrostola tripartita Hufn. (Light Spectacle). 1 Aug. (K.H.P.).

Lygephila pastinum Treits. (Plain Blackneck). 10 July (H.W.B.).

Schrankia taenialis Hubn. (White-line Snout). 9 July (H.W.B.).

Brephos parthenias Linn. (Common Orange-underwing). March/April. (H.W.B., C.S.H.B.).

B. notha Hubn. (Light Orange-underwing). March/April (H.W.B.).

Hemistola immaculata Thunb. (Lesser Emerald). 29 June, 24 July (C.S.H.B.).

Nothopteryx polycommata Hubn. (Barred Tooth-striped). Common at Sallow. 26 March (C.S.H.B.).

Chloroclysta siterata Hufn. (Red-green Carpet). 11 Oct. (C.S.H.B.).

C. miata Linn. (Autumn Green Carpet). 13 April (C.S.H.B.).

Rhodometra sacraria Linn. (Vestal). One female taken at Penarth, 17 Sept., which laid a few ova from which moths were bred, emerging between Nov. 19 and 23. One male taken after dark at Ivy on 4 Oct. (C.S.H.B.).

Nyctosia obstipata Fabr. (Narrow-barred Carpet). 16 July (H.W.B.).

Gymnoscelis pumilata Hubn. (Double-striped Pug). 6 Feb. (C.S.H.B.). A very early date.

Horisme vitalbata Hubn. (Umber Waved Carpet). 20 Aug. (C.S.H.B.).

Alsophila aescularia Schiff. (March Usher). 30 Jan. (C.S.H.B.). An early date.

Cleora repandata Linn. (Mottled Beauty). var. *conversaria*. 23 June to 9 July (J.F.B., H.W.B.).

C. rhomboidaria Schiff. (Willow Beauty). Small, suffused example of a second generation. 2 Oct. (J.F.B.).

Pyrausta cingulata Linn. (Silver-barred Sable). 11 July at light (H.W.B.).

Loxostege sticticalis Linn. (Diamond Spot Pearl). 12 July. Only recorded twice before from Somerset (H.W.B.).

Evergestis pallidata. A pair 9 and 10 July ; not previously reported from Somerset (H.W.B.).

Crambus latistrius Haw. (Broad-streak Grass-veneer). 28 Aug. (H.W.B.).

BRISTOL INSECT FAUNA
DIPTERA

COMPILED BY H. L. F. AUDCENT, M.Sc.

(*Continued*)

Sub-Order : Cyclorrhapha

The fly leaves the puparium by pushing open one end like a lid.

Division :—ASCHIZA

The lunula (a sclerite situated above the base of the antennae) is small and crescentic when present, but may be absent.

Family :—**Clythiidae** (Platypezidae)

Small flies, dark with light markings ; eyes touching in the male ; antenna with three segments and an apical arista ; hind-tarsi dilated ; wings with six longitudinal veins and some cross-veins ; sluggish flies caught by sweeping, especially in the vicinity of fungi, in which live the larvae which are flat and broad.

MICROSANIA Zett. 1857

Very small flies found in the smoke of burning vegetable matter ; third longitudinal vein obsolete, no cross-veins ; life-history unknown.

pectinipennis Mg. 1830. **G.** Filton (F.) 29/8/47 and 1/9/47. **S.** Clevedon (Bd.) 25/8/47.

pallipes Mg. 1830. **S.** Clevedon (Bd.) 30/8/47.

OPETIA Mg. 1830

No outer cross-vein between the fourth and fifth longitudinal veins, fourth longitudinal vein forked.

nigra Mg. 1830. **S.** Backwell (A.) 21/4/27, Kenn Moor (A.) 27/6/39, Portishead (F.) 24/5/47, Loxley Wood, Shapwick (F.) 24/4/49, Walton Moor (F.) 30/4/49.

CALLOMYIA Mg. 1804

Outer cross-vein present, fourth longitudinal not forked, first longitudinal vein setulose.

amoena Mg. 1824. **G.** Coombe Dingle (F.) 9/6/46. **S.** Leigh Woods (Dl.) 25/5/45, West Town (F.) 22/6/47.

speciosa Mg. 1824. **G.** Stone (A.) 28/7/28.

AGATHOMYIA Verr. 1901

Like Callomyia, but first longitudinal vein bare.

viduella Zett. 1838. **G.** Coombe Dingle (F.) 15/6/47. **S.** Brockley Combe (A.) 17/5/47, West Town (A.) and (F.) 17/5/47.

antennata Zett. 1819. **G.** Coombe Dingle (F.) 9/6/46 and 19/8/46. **S.** Clevedon (A.) 28/5/40 and 21/8/40, West Town (F.) 27/5/47, Edington (Cw.) 8/6/47, Leigh Woods (F.) 11/6/49.

CLYTHIA Mg. 1800 (PLATYPEZA Mg. 1803)

Outer cross-vein present and fourth longitudinal vein forked.

dorsalis Mg. 1804. **G.** Durdham Down (F.) 22/8/46. **S.** Clevedon (A.) 29/7/40 and 1/8/40, Failand (F.) 14/10/49.

consobrina Mg. 1824. **G.** Bristol (Wm.) 7/10/22 and (F.) 7/10/44, Blaise Castle (F.) 8/11/47 ex *Armillaria mellea* (Vahl.) Fr. **S.** Wells (L.), Clevedon (A.) 25/10/47 ex *A. mellea* (Vahl.) Fr., Loxley Wood, Shapwick (Cw.) 24/9/48), Buncombe (Cw.) 14/10/49.

atra Mg. 1804. **G.** Durdham Down (F.) 1/7/46 and 1/9/47. **S.** Weston-s-Mare (J.), Sharpham (A.) 17/7/25, Clevedon (A.) 16/6/41, Tickenham (A.) 19/6/43.

rufa Mg. 1830. **G.** Blaise Castle (F.) 12/10/47. **S.** Wells (L.), Leigh Woods, (A.) 10/9/34, Clevedon (A.) 25/10/47 ex *A. mellea* (Vahl.) Fr., Loxley Wood, Shapwick (Cw.) 21/9/48, Buncombe (Cw.) 14/10/49.

modesta Zett. 1844. **G.** Blaise Castle (F.) 12/10/47. **S.** Wells (L.), Leigh Woods (A.) 10/9/34, Clevedon (A.) 25/10/47 ex *A. mellea* (Vahl.) Fr., Loxley Wood, Shapwick (Cw.) 24/9/48, Buncombe (Cw.) 14/10/49.

fasciata Mg. 1804. **S.** Chew Magna (H.) 27/8/19, Loxley Wood, Shapwick (Cw.) 24/9/48.

hirticeps Verr. 1901. **G.** Bristol (Wm.) 7/10/22. **S.** Leigh Woods (A.) 10/9/34.

infumata Hal. 1838. **G.** Olveston (A.) 6/21, Durdham Down (F.) 9/7/47. **S.** Wells (L.), Clevedon (A.) 25/9/39 and 15/6/40, Buncombe (Cw.) 8/9/48.

picta Mg. 1830. **G.** Tewkesbury (A.) 1/11/25, Blaise Castle (F.) 18/10/47. **S.** Wells (L.)

Family :—Dorilaidae (PIPUNCULIDAE)

Small, dark flies with iridescent wings ; head very large, globular ; large eyes which quite or almost touch in the male ; arista dorsal ; female has a long ovipositor bent under the venter ; in wing, six longitudinal veins, the fourth vein is bent upwards and the lower, outer cross-vein is usually present ; the flies hover over herbage and bushes ; the larvae are parasitic on Homoptera.

CHALARUS Wlk. 1834

Head not puffed out behind the eye-margin when seen in profile ; apical antennal segment oval ; lower, outer cross-vein absent, fourth longitudinal vein weak.

spurius Fall. 1816. **G.** and **S.** Common.

VERRALLIA Mik 1899

Like CHALARUS, but lower, outer cross-vein present.

pilosa Zett. 1838. **G.** Stroud (W.), Wotton-under-Edge (P.), Morton (F.) 14/7/47. **S.** Leigh Woods (Wm.) 21/5/22, Backwell (A.) 11/7/25, Clevedon (A.) 14/5/40.

setosa Verr. 1901. **G.** Coombe Dingle (F.) 8/4/48, Blaise Castle (F.) 8/5/48. **S.** Leigh Woods (A.) 26/5/26, Clevedon (A.) 15/5/41.

villosa v.Ros. 1840. **G.** Cranham (Wt.), Hanham (C.), Filton (F.) 5/5/49. **S.** Leigh Woods (C.), Cadbury Camp (F.) 11/5/47.

aucta Fall. 1817. **G.** and **S.** Common.

DORILAS Mg. 1800 (PIPUNCULUS Lat. 1802)

Head puffed out behind the eye-margin when seen in profile ; apical antennal segment rostrate ; lower, outer cross-vein present.

littoralis Beck. 1897. **S.** Berrow (Cw.) 12/8/49.

silvaticus Mg. 1824. **S.** Berrow (A.) 19/7/25, Sharpham (A.) 9/8/25.

geniculatus Mg. 1824 **G.** Clifton (C.), Wotton-under-Edge (P.), Olveston (A.) 30/7/22, Kingsweston (A.) 1/6/22. **S.** Wells (L.), Shepton Mallet (C.), Axbridge (Rd.), Keynsham (A.) 19/7/26, Berrow (A.) 13/7/30, Clevedon (A.) 26/8/40.

nigritulus Zett. 1844. **S.** Wells (L.).

semimaculatus Beck. 1897. **G.** Kingsweston (A.) 7/21. **S.** Berrow (A.) 26/6/39.

haemorrhoidalis Zett. 1838. **S.** Catcott (Cw.) 24/5/47, Wedmore (Cw.) 23/7/47.

incognitus Verr. 1901 (*geniculatus* auctt. *nec* Mg.). **S.** Flax Bourton (H.), Cadbury Camp (F.) 11/5/47.

imparatus Coll. 1937. **S.** Loxley Wood, Shapwick (Cw.) 19/5/47.

rufipes Mg. 1824 (*confusus* Verr. 1901). **G.** Filton (F.) 21/4/48. **S.** Priddy (A.) 6/6/37, Clevedon (A.) 14/5/27, Portbury (F.) 31/5/47.

furcatus Egg. 1860. **G.** Coombe Dingle (F.) 30/5/48. **S.** Loxley Wood, Shapwick (Cw.) 26/5/47.

ruralis Mg. 1824. **G.** Blaise Castle (F.) 3/9/49.

unicolor Zett. 1844. **G.** Olveston (C.).

montium Beck. 1897. **G.** Filton (F.) 22/5/40.

terminalis Thoms. 1869. **S.** Clevedon (A.) 5/9/40, Loxley Wood, Shapwick (Cw.) 24/9/48.

fuscipes Zett. 1844. **G.** Chalford (Wt.), Awkley (A.) 8/9/22, Shepperdine (A.) 5/8/24, Kingsweston (A.) 1/6/22, Coombe Dingle (F.) 30/5/48, Filton (F.) 19/7/48. **S.** Nailsea (A.) 28/6/39, Clevedon (A.) 4/7/41, Catcott (Cw.) 24/5/47 and 27/5/48, Edington Moor (Cw.) 31/5/49.

zonatus Zett. 1847. **G.** Olveston (A.) 30/7/22, Hallen (B.) 11/7/29, Coombe Dingle (F.) 3/7/48, Filton (F.) 19/7/48. **S.** Loxley Wood, Shapwick (Cw.) and (F.) 21/6/47, Edington (Cw.) 8/7/48.

thomsoni Beck. 1897 (*carinatus* Verr. 1901). **G.** Hallen (B.) 11/7/29, Coombe Dingle (F.) 26/6/47, Chalford (F.) 15/7/47, Filton (F.) 24/6/48, Bristol (F.) 14/7/48. **S.** Clevedon (A.) 14/5/40 and 21/5/41, Loxley Wood, Shapwick (Cw.) 2/7/47, Moorlinch (Cw.) 10/6/49.

spinipes Mg. 1830. **G.** Hallen (B.) 30/7/40, Coombe Dingle (F.) 30/5/48, Filton (F.) 11/9/48. **S.** Tickenham (A.) 23/6/29, Cadbury Camp (F.) 12/7/47.

varipes Mg. 1824. **S.** Loxley Wood, Shapwick (Cw.) 26/6/48.

ater Mg. 1824 (*campestris* Verr. *nec* Lat.). **G.** and **S.** Common.

ultimus Beck. 1900. **G.** Durdham Down (F.) 4/9/47.

semifumosus Kow. 1887 (*strigulipes* Verr. 1901). **S.** Brockley Combe (A.) 31/8/33, Holford (Cw.) 30/8/47, Loxley Wood, Shapwick (Cw.) 6/9/47.

pulchripes Thoms. 1869. **G.** Coombe Dingle (F.) 26/10/47. **S.** St. Audries (A.) 1/9/29.

flavipes Mg. 1824. **S.** Loxley Wood, Shapwick (Cw.) 19/6/44 and 22/7/49.

vittipes Zett. 1844. **G.** Coombe Dingle (F.) 20/5/47. **S.** West Town (F.) 25/5/47, Leigh Woods (F.) 11/6/49.

Family :—**Syrphidae**

Large or medium-sized flies, black or black and yellow, bare like wasps or hairy like bees ; eyes usually touching in the male ; arista dorsal ; wing with six longitudinal veins, of which the first two may coalesce before reaching the edge of the wing, four cross-veins ; between the third and fourth longitudinal veins there is a fold (vena spuria) ; the flies hover and alight on flowers and leaves ; the larvae are carnivorous (feeding on Aphids), saprophagous (rat-tail larvae) or parasitic on plants (Narcissus Bulb Fly).

S. F. Tubiferinae (Eristalinae)

MICRODON Mg. 1803

Medium-sized, dark, almost bare flies ; antennae long, arista short, bare ; eyes bare, separate in both sexes ; the third longitudinal vein bears a veinlet which goes down between the two cross-veins ; larvae resemble Slugs and live in Ants' nests. Rare.

mutabilis L. 1758. **S.** Langport (Bl.), Porlock (Cr.) and (Bw.) 5/4/44, Shapwick (Cw.) 25/5/48, Holford (Cw.) and (F.) 12/6/48, Street Heath, Sharpham (Cw.) and (F.) 21/5/49.

rhenanus And. 1912. **S.** Castle Neroche (Wm.) 9/6/24.

VOLUCELLA Geoff. 1762

Large Fly, hairy like a Bumble-Bee (*bombylans*) or almost bare with semi-transparent, yellow-white band on abdomen (*pellucens*) or with yellow markings; arista long-plumose; eyes hairy, touching in male; wing with first and second longitudinal veins meeting before reaching the costa, third vein straight; larvae live as scavengers in nests of Bumble Bees, Wasps and Hornets.

zonaria Poda 1711. **G.** Bristol (Ly.). Very rare.

inanis L. 1758. **S.** Porlock (C.), Leigh Woods (H.), Dunster (A.) 8/16. Rare.

pellucens L. 1758. **G.** and **S.** Fairly common.

inflata F. 1794. **G.** Wotton-under-Edge (P.), Cirencester (T.) 16/6/17, Blaise Castle (Wm.) 25/6/22 and (F.) 8/7/48, Dursley (Wm.) 17/6/22, Kingsweston (A.) 6/7/24 and (F.) 29/7/35, Coombe Dingle (F.) 7/6/47. **S.** Portishead (Bt.), Shepton Mallet (C.) 16/6/10, Weston-s-Mare (J.) 6/6/17, Clevedon (A.) 4/7/41 and 24/6/45, Loxley Wood, Shapwick (Cw.) 19/6/44 and 26/6/48, Edington (Cw.) 22/6/46, West Town (Cw.) 28/6/47 and (F.) 25/5/47; Goblin Combe (F.) 13/6/37. Uncommon.

bombylans L. 1758. **G.** and **S.** Common; usually this is var. *plumata* Deg. 1776.

LAMPETIA Mg. 1800 (MERODON Mg. 1803)

Bee-like flies; arista bare; third longitudinal vein with a deep loop in its apical portion; hind-femora thickened and with a dentate process at the apex; whole body covered with fine hairs which vary in colour—black, red, yellow or white in bands, and so there are many vars. of the one species; larvae live in bulbs of various plants, especially *Narcissus*.

equestris F. 1794 var. *equestris* s.str. **G.** and **S.** Common, mostly males.

var. *bulborum* Rond. 1845. **G.** and **S.** The commonest var., mostly males.

var. *flavicans* F. 1794. **G.** Kingsweston (A.) 26/6/31. **S.** Wembdon (Tr.) 3/6/22, Leigh Woods (Wm.) 25/5/26, Clevedon (A.) 3/6/40 and 28/5/44. A male var.

var. *narcissi* F. 1805. **G.** Durdham Down (F.) 30/5/47, Filton (F.) 4/6/47, Coombe Dingle (F.) 15/6/47. **S.** Brockley Combe (Wm.) 22/5/20, Tickenham (A.) 8/21, Wembdon (Tr.) 21/5/21, Clevedon (A.) 3/6/40. A male var.

var. *nobilis* Mg. 1822. **G.** Olveston (A.) 6/18. **S.** Wembdon (Tr.) 3/6/22. A female var.

var. *transversalis* Mg. 1822. **G.** Durdham Down (F.) 30/5/47. **S.** Wembdon (Tr.) 31/5/21, Clevedon (A.) 13/6/41. A female var.

var. *valida* Wied. 1822. **G.** Olveston (C.), Bristol (Bt.), Kingsweston (A.) 27/5/34, Dursley (A.) 9/6/35, Filton (F.) 6/6/46, Blaise Castle (F.) 24/4/48. **S.** Wembdon (Tr.) 21/5/21, Tickenham (A.) 6/21, Cannington (Sl.) 1/6/26. A female var.

In addition to the above vars. there seem to be intermediate forms.

ANASIMYIA Schin. 1864 (EURINOMYIA Mik 1897)

Medium-sized, narrow, black and yellow flies; eyes bare, separated in both sexes; antennae orange or brown, arista bare; lower part of face more or less snout-like; hind-femora swollen, hind-tibiae curved; first and second longitudinal veins not meeting, third longitudinal vein with a deep loop; larvae are rat-tailed maggots living in mud.

lineata F. 1787. **S.** Shapwick (J.) 1/8/19 and (A.) 12/8/23, Ashcott (Bt.), Banwell (J.) 14/8/22, Clevedon (A.) 17/6/42 and (F.) 23/6/47, Edington (Cw.) 6/7/46, Street Heath, Sharpham (Cw.) 30/6/43, 6/9/47 and 28/8/48. Uncommon, on damp moors.

transfuga L. 1758. **G.** Bitton (C.) 19/7/07, Walham (Wd.) 6/9/41. **S.** Weston-s-Mare (J.), Sharpham (A.) 6/8/22, Clevedon (A.) 17/6/42 and (F.) 23/6/47, Street Heath, Sharpham (Cw.) 8/7/43 and 27/7/47, Halberton (Cw.) 29/7/47. Fairly common, on damp moors.

lunulata Mg. 1822. **S.** Shapwick (Dl.) 1892, Ashcott (J.) 28/8/20. Rare.

PARHELOPHILUS Girsch. 1897

Medium-sized, broad flies, resembling Anasimyia, but face not produced.

frutetorum F. 1775. **G.** Olveston (C.) 5/7/19, Coombe Dingle (F.) 15/6/47. **S.** Tickenham (A.) 2/6/25, Edington (Cw.) 29/5/44 and 4/6/47. Rare.

versicolor F. 1794. **G.** and **S.** Fairly common.

consimilis Malm. 1863. **S.** Catcott (Cw.) 27/5/48, Edington (Cw.) 2/8/48.

HELOPHILUS F. 1805

Like Anasimya, but large, broad, antennae black and face not produced.

parallelus Harr. 1776 (*trivittatus* F. 1805). **G.** Olveston (C.) 4/9/17, Shepperdine (A.) 9/8/24. **S.** Cheddar (Curtis), Weston-s-Mare (J.), Shapwick (A.) 3/9/22, Berrow (A.) 27/8/24, Clevedon (A.) 1/9/39, Edington (Cw.) 21/6/47. Moderately common.

hybridus Lw. 1846. **G.** Shepperdine (A.) 9/8/24. **S.** Portishead (Bt.), Shapwick (J.) 8/17 and (A.) 20/5/23, Nailsea (Wm.) 6/25, Clevedon (A.) 11/4/39. Edington (Cw.) 26/6/47, Holford (Cw.) 30/8/47, Street Heath, Sharpham (Cw.) 28/8/48. Fairly common.

pendulus L. 1752. **G.** and **S.** Very common.

ERISTALINUS Rond. 1845

Medium-sized, slightly hairy, black, somewhat aeneous ; arista bare ; eyes hairy, spotted, separated in both sexes ; first and second longitudinal veins meet just before reaching the costa, third longitudinal vein with a deep loop ; larvae are rat-tailed maggots living in mud.

sepulchralis L. 1758. **G.** and **S.** Fairly common.

LATHYROPHTHALMUS Mik 1897

Like Eristalinus, but larger ; eyes not so hairy and touching in male.

aeneus Scop. 1763. **G.** and **S.** Not uncommon in coastal districts ; larvae in decomposing sea-weed.

MALLOTA Mg. 1822

S. G. Zetterstedtia Rond. 1845

Large, densely pilose species, hairs yellow on thorax, black (and some white) on abdomen ; arista bare ; hind-femora swollen with dense bunch of hairs near apex ; wing with deep loop in third longitudinal vein ; larvae are long-tailed maggots living in rotten wood.

cimbiciformis Fall. 1817. **G.** Blaise Castle (Wm.) 25/6/22. **S.** Weston-s-Mare (J.), Edington (Cw.) 4/6/47 and (F.) 20/6/48. Rare.

MYATHROPA Rond. 1846 (*emend.* Myatropa Lioy 1864, Myiatropa Verr. 1901)

Medium-sized, slightly hairy flies, the light coloured markings on the dark thorax vaguely simulating a 'death's head' ; the abdomen black with large, yellow, transverse spots ; arista bare ; wing as in Mallota, first and second longitudinal veins separate, but occasionally meet before apex ; hind-femora not swollen ; larvae like those of Mallota.

florea L. 1758 var. *nigrotarsata* Schin. 1862. **G.** and **S.** Very common.

var. *flavofemorata* Strob. 1902. **G.** Olveston (A.) 1/8/22. Rare.

TUBIFERA Mg. 1800 (Eristalis Lat. 1804)

Like Lathyrophthalmus, but eyes not spotted ; some species (e.g. *intricaria* L.) densely hairy, others (e.g. *tenax* L.) almost bare. Arista bare or, at most, pubescent in the following two species :—

tenax L. 1758. **G.** and **S.** Very common.

lyra Harr. 1776 (*abusiva* Coll. 1931 *lucorum* auctt. *nec* Mg.). **S.** Backwell (Wm.) 16/4/27, Berrow (A.) 27/8/30, Tickenham (A.) 1/7/33. Uncommon.

Arista plumose :—

intricaria L. 1758. **G.** and **S.** Fairly common.

var. *furva* Verr. 1901. **G.** and **S.** Fairly common.

arbustorum L. 1758. **G.** and **S.** Very common.

rupium F. 1805. **G.** Painswick (W.), Wotton-under-Edge (P.). Rare.

horticola Deg. 1776. **G.** and **S.** Fairly common.

pertinax Scop. 1763. **G.** and **S.** Very common.

nemorum L. 1758. **G.** and **S.** Fairly common.

PARAGOPSIS Mats. 1915 (Eumerus Mg. 1822 *nec* Mg. 1804)

Small to medium-sized flies, bare, black with pale markings or red patches ; arista bare ; hind-femora spinose ; third longitudinal vein with shallow loop, lower, outer cross-vein angulated ; larvae live in bulbs (e.g. *Allium*).

ornatus Mg. 1822. **G.** Olveston (C.), Dursley (Wm.) 17/6/22, Hallen (A.) 19/6/26. **S.** Freshford (C.), Clevedon (A.) 8/8/39, West Town (F.) 22/6/47. Uncommon.

strigatus Fall. 1817 (*lunulatus* Mg. 1822). **G.** and **S.** Fairly common.

tuberculatus Rond. 1857. **G.** Filton (A.) 22/5/35, Durdham Down (F.) 29/3/48. **S.** Clevedon (A.) 23/5/39, 1/7/40 and 10/9/43, Edington (Cw.) 31/5/42, Ebbor, Wells (Cw.) 31/8/48, Walton Moor (F.) 23/8/47. Fairly common.

EUMENOS Mg. 1817 (Syritta Lep. and Serv. 1817)

Rather small, slender, black flies with yellow spots on abdomen ; hind-femora swollen, spinulose ; third longitudinal vein almost straight ; larvae saprophagous.

pipiens L. 1758. **G.** and **S.** Very common.

MYOLEPTA Newm. 1838

Like Eumenos but larger, and hind-femora not so swollen ; larvae in rotten wood.

potens Harr. 1776. **G.** Coombe Dingle (Lw.) 13/6/45, Blaise Castle (F.) 26/6/49. **S.** Loxley Wood, Shapwick (Cw.) 3/7/45, Edington (Cw.) 18/7/45 and 21/6/46 and (F.) 5/7/47.

TROPIDIA Mg. 1822

Medium-sized, bare species with red markings on abdomen, like a large Eumenos ; eyes bare, touching in male ; hind-femora much swollen and bearing a triangular tooth below at apex ; third longitudinal vein slightly dipped ; larvae live in mud in marshes. Uncommon.

scita Harr. 1776. **S.** Ashcott (Wm.) 3/6/22, Edington (Cw.) 19/5/42, Street (Cw.) 30/6/43 and 6/7/48, Walton Moor (F.) 13/8/47 and (A.) 4/6/48, Ham Green (F.) 7/7/45.

ZELIMA Mg. 1800 (Xylota Mg. 1822)

Medium to large, bare, black flies with more or less red or yellow on abdomen or some golden hairs at apex ; eyes bare, touching in male ; arista long and bare ; abdomen long and usually narrow ; hind-femora somewhat swollen and spinulose below, hind-tibiae somewhat curved, hind-trochanters of male spurred except in *lenta* ; first and second longitudinal veins not meeting and third vein without loop ; larvae live in rotten wood ; flies found in woods.

segnis L. 1758. **G.** and **S.** Very common.

tarda Mg. 1822. **S.** Loxley Wood, Shapwick (Cw.) 3/7/45. Rare.

lenta Mg. 1822. **G.** Selsley (Wt.), Wotton-under-Edge (P.), Blaise Castle (Wm.) 25/6/22, Kingsweston (A.) 9/6/23, Stroud (Fl.) 1/6/40, Coombe Dingle (F.) 8/6/47. **S.** Minehead (Bl.), Weston-s-Mare (J.) 1/7/17, Loxley Wood, Shapwick (A.) 5/7/47, (F.) 21/6/47 and (Cw.) 20/6/48, Edington (Cw.) 27/5/44. Uncommon.

sylvarum L. 1758. **G.** Filton (F.) 12/6/45, Coombe Dingle (F.) 3/7/45. **S.** Weston-s-Mare (J.) 8/16, Banwell (J.) 10/6/17, Freshford (C.), Shapwick (A.) 14/8/25, Clevedon (A.) 17/7/41, Edington (Cw.) 26/5/43, Loxley Wood Shapwick (A.), (F.) and (Cw.) 5/7/47, West Town (Cw.) 28/6/47, Holford (Cw.) 11/9/47. Uncommon.

xanthocnema Coll. 1939. **G.** Olveston (C.) 7/17, Blaise Castle (A.) 6/21 and (F.) 24/6/25. **S.** Edington (Cw.) 16/7/44, (A.) 5/7/47 and (F.) 19/6/48, Loxley Wood, Shapwick (Cw.) 19/6/44, Holford (Cw.) 30/8/47. Uncommon.

florum F. 1805. **G.** Forest of Dean (J.) and (Y.) 1/8/97. Rare.

semulater Harr. 1776 (*abiens* Mg. 1822). **G.** Stone (A.) 27/6/28. **S.** Loxley Wood, Shapwick (Cw.) 8/7/45 and (Cw. and F.) 5/7/47. Rare.

XYLOTOMIMA Shan. 1926

Like ZELIMA *Florum* F., but is smaller; has hind-femora more swollen and no spur on hind-trochanter of male.

nemorum F. 1805. **G.** Blaise Castle (F.) 28/3/48, Coombe Dingle (F.) 22/8/48. **S.** Dunster (A.) 8/16, Taunton (Pa.), Oakhill (Cw.) 9/7/46, Catcott (Cw.) 27/5/48, Holford (Cw.) 12/6/48, West Town (F.) 25/5/47. Uncommon.

POCOTA Lep. and Serv. 1828

Moderately large, Bee-like, hairy flies; eyes bare, touching in male; hind-femora swollen but not spinulose; antennae reddish-brown, arista bare; wing normal; larvae in rotten wood.

personata Harr. 1776 (*apiformis* Schrk. *nec* Deg.). **S.** Leigh Woods (Verrall) 1841, Weston-s-Mare (J.) 23/5/16, Catcott (Cw.) 4/5/49. Very rare.

PENTHESILEA Mg. 1800 (CRIORHINA Mg. 1822)

Like POCOTA, but larger, eyes separate in both sexes and face prolonged below eyes. All uncommon.

ranunculi Panz. 1804. **G.** Painswick (W.), Wotton-under-Edge (P.), Cirencester (T.), Morton (F.) 13/4/46, Coombe Dingle (F.) 11/5/46. **S.** Backwell (J.) 2/4/21, (A.) 30/4/22 and (Wm.) 2/4/26, Portishead (Bt.) Wedmore (Mp.), Leigh Woods (F.) 31/3/44, Cadbury Camp (F.) 12/5/46, Ham Green (F.) 19/4/47.

berberina F. 1805. **G.** Selsley (Wt.), Wotton-under-Edge (P.), Kingsweston (A.) 9/6/23, Blaise Castle (A.) 28/5/27, Durdham Down (F.) 30/5/47, Coombe Dingle (F.) 10/6/47. **S.** Weston-s-Mare (J.), Portishead (Bt.), Shepton Mallet (C.) 15/6/10, Ashcott (Wm.) 2/6/23, Banwell (A.) 6/6/25, Clevedon (A.) 26/4/44, Loxley Wood, Shapwick (Cw.) 10/7/46 and 2/8/48, Oakhill (Cw.) 29/6/47, Edington (Cw.) 4/6/47, Cadbury Camp (F.) 12/5/46, Failand (F.) 31/5/47, Barrow Gurney (F.) 27/6/48.

oxyacanthae Mg. 1822. **G.** Painswick (W.), Wotton-under-Edge (P.), Olveston (C.) 6/19, Kingsweston (A.) 9/6/23 and 8/5/27. **S.** Weston-s-Mare (J.), Banwell (J.) 10/6/17, Portishead (Bt.), Freshford (A.) 28/5/38, Loxley Wood, Shapwick (Cw.) 3/7/45 and 2/7/48, East Harptree (Cw.) 25/6/47, West Town (Cw.) 28/6/47. Probably conspecific with the previous species.

floccosa Mg. 1822. **G.** Selsley (Wt.), Cirencester (T.) 14/6/24, Dursley (Wm.) 11/6/22, Durdham Down (F.) 30/5/47, Coombe Dingle (F.) 7/6/48. **S.** Taunton (Wm.) 7/6/24, Cannington (Sl.) 4/6/26, Portishead (Bt.), Clevedon (A.) 23/5/39 and 3/6/40, Edington (Cw.) 29/5/44 and 8/6/47.

asilica Fall. 1816. **G.** Olveston (C.) 21/5/16 and (A.) 5/17, Kingsweston (A.) 6/21, Elberton (C.) 29/5/18, Cirencester (T.) 14/6/24, Coombe Dingle (F.) 10/6/47. **S.** Flax Bourton (H.) 28/5/18, Backwell (Wm.) 22/5/20, Leigh Woods (A.) 25/5/29.

ARCTOPHILA Schin. 1860

Large flies thickly covered with long, yellow hairs; eyes bare, touching in male; arista plumose; hind-femora somewhat swollen; wing normal; fly found in woods; life-history unknown. Rare.

fulva Harr. 1776 (*mussitans* F. 1777). **G.** Painswick (W.), Colesborne (J. Edwards) 7/8/45, Rodborough (Fl.) 17/8/40. **S.** Batheaston (Bl.), Porlock (C.), Bossington (Cw.) 29/9/46, Holford (Cw.) 30/8/47.

CINXIA Mg. 1800 (SERICOMYIA Mg. 1803)

Large, bare flies, black with yellow bands on abdomen, otherwise like ARCTOPHILA ; larvae are long-tailed maggots living in peat-bogs.

silentis Harr. 1776 (*borealis* Fall. 1816). **G.** Wotton-under-Edge (P.), Rockhampton (A.) 9/8/24. **S.** Sharpham (A.) 22/8/22 and 11/7/25, Shapwick (St.) 28/6/28, Stoke Pero (La.) 20/8/47, Edington (Cw.) 24/5/45, Holford (Cw.) 30/8/47.

lappona L. 1758. **G.** Staple Hill, Bristol (Pa.). **S.** Shapwick (J.), (A.) 20/5/23 and (Cw.) 13/5/46, West Lyn Head, Exmoor (Cw.) 26/6/41, Overstowey (Cw.) 24/5/46, Holford (Pn.), (Cw.) and (F.) 12/6/48.

BRACHYPALPUS Macq. 1834

Medium-sized, hairy, somewhat aeneous flies ; eyes bare, touching in male ; hind-femora much swollen and spinulose beneath, hind-tibiae curved ; first and second longitudinal veins not meeting, third vein without loop, wing with dark cloud across the middle ; larvae probably in rotten wood. Rare.

bimaculatus Macq. 1827. **G.** Coombe Dingle (Lw.) 24/6/47 and (F.) 7/6/47. **S.** Tickenham (A.) 26/7/24, Leigh Woods (Lw.) 9/5/44.

BRACHYOPA Mg. 1822

These flies resemble House-flies in size and shape, but the abdomen is red and the wing has the Syrphid type of venation ; larvae in exudations of old tree-trunks.

insensilis Coll. 1939. **G.** Coombe Dingle (F.) 9/5/46 and 2/8/46. **S.** Edington (Cw.) 2/6/47.

scutellaris R.D. 1844. **G.** and **S.** Fairly common.

N.B.—This is probably the species listed as *B. bicolor* Fall. ; so far there is no local record of *bicolor*.

RHINGIA Scop. 1793

A medium-sized fly with dark thorax and more or less reddish-yellow abdomen; face produced like a snout ; larvae in cow-dung.

rostrata L. 1758. **S.** Clevedon (A.) 27/5/44. Rare.

campestris Mg. 1822 (*macrocephala* Harr. 1776 ?). **G.** and **S.** Very common.

PIPIZA Fall. 1810

Medium-sized, black flies, sometimes with yellow markings on abdomen ; face black, without knob or snout ; apical antennal segment short ; frons protruding ; eyes hairy, touching in male ; larvae live in the open, feeding on Aphids.

festiva Mg. 1822 (*luteitarsis* Zett. 1842). **G.** Kingsweston (A.) 17/5/24, Coombe Dingle (F.) 9/5/46. **S.** Weston-s-Mare (J.) 13/5/21, Clevedon (A.) 3/6/40 and 5/5/42. Uncommon.

noctiluca L. 1758. **G.** and **S.** Fairly common.

var. *fenestrata* Mg. 1822. **G.** Filton (A.) 22/5/30. **S.** Banwell (J.) 17/5/21, Weston-s-Mare (J.) 20/5/20. Uncommon.

bimaculata Mg. 1822. **G.** Olveston (C.), Kingsweston (A.) 6/5/23. **S.** Leigh Woods (H.) 3/6/19, Sharpham (A.) 8/8/25, Clevedon (A.) 15/5/42, Edington (Cw.) 21/5/42, Loxley Wood, Shapwick (Cw.) 5/7/45, Street Heath, Sharpham (Cw.) 11/7/45.

austriaca Mg. 1822 (*lugubris* Verr. *nec* F.). **G.** and **S.** Fairly common.

lugubris F. 1775. **S.** Loxley Wood, Shapwick (Cw.) 4/7/45. Rare.

PHALANGUS Mg. 1822 (HERINGIA Rond. 1856, PIPIZELLA Rond. 1856)

Like PIPIZA, but frons not protruding and apical antennal segment long ; abdomen unspotted except female of *flavitarsis*.

virens F. 1805. **G.** and **S.** Very common. There are two species here, the second (and commoner) species being, according to Mr. J. E. Collin, *varipes* Mg. Both species have been taken freely by Mr. J. Cowley in the Edington district of Somerset.

flavitarsis Mg. 1822 (*biguttatus* Curt. 1837). **S.** Catcott (Cw.) 24/5/47 and 24/5/48, Shapwick (Cw.) 25/5/48, Edington (Cw.) 10/7/48, Holford (Cw.) and (F.) 12/6/48. Uncommon.

heringi Zett. 1842 (*dubius* Lundb. 1916 *nec* Big.). **S.** Weston-s-Mare (J.) 14/5/23, Leigh Woods (H.), Clevedon (A.) 17/5/41 and 5/5/42, Loxley Wood, Shapwick (Cw.) 19/5/47 and 28/5/49. Uncommon.

NEOCNEMODON Goffe 1944 (Cnemodon Egg. 1865 *nec* Schoen. 1823)

Like Phalangus, but apical antennal segment short.

vitripennis Mg. 1822. **G.** Bristol (C.), Cirencester (T.) 12/7/23, Olveston (A.) 2/9/23, Shepperdine (A.) 20/8/24, Coombe Dingle (F.) 10/6/46. **S.**, Freshford (C.), Sharpham (A.) 22/8/22, Clevedon (A.) 23/7/40 and 2/8/41 Edington (Cw.) 23/7/44. Uncommon.

latitarsis Egg. 1865. **S.** Banwell (J.) 25/7/22, Over Stowey (Cw.) 24/5/46.

NEOASCIA Willist. 1886 (Ascia Mg. 1822 *nec* Scop. 1777)

Small, bare, black flies ; abdomen with a thorn on each side at the very base and the basal segments constricted, apical segments narrow in male, broad in female, and they may bear yellow markings ; arista bare ; eyes bare, separated in both sexes ; wing normal, upper, outer cross-vein straight and perpendicular ; hind-femora swollen and spinulose ; short-tailed larvae live in mud in marshy situations.

podagrica F. 1775. **G.** and **S.** Common.

aenea Mg. 1822 (*dispar* Zett. *nec* Mg.). **G.** Bristol (C.). **S.** Cheddar (G.). Shapwick (A.) 20/5/23 and 24/8/25, Street Heath, Sharpham (Cw.) 21/5/49, Uncommon.

dispar Mg. 1822 (*floralis* auctt. *nec* Mg.). **G.** Bristol (C.). **S.** Weston-s-Mare (J.), Shapwick (A.) 17/6/23 and (Cw.) 25/5/48, Sharpham (A.) 4/8/25, Edington (Cw.) 9/5/48, Kenn Moor (A.) 29/6/41, Shapwick Heath (Cw.) 24/4/49, Street Heath, Sharpham (Cw.) 23/4/49. Not uncommon.

geniculata Mg. 1822. **G.** Littledean (A.) 25/5/31. **S.** Dunster (A.) 8/6/24, West Town (Wm.) 12/6/27, Street Heath, Sharpham (Cw.) 28/8/48. Uncommon.

SPHEGINA Mg. 1822

Like Neoascia, but somewhat larger ; abdomen without thorns at base ; arista pubescent ; upper, outer cross-vein rounded and oblique.

clunipes Fall. 1816. **G.** Painswick (W.), Blaise Castle (Wm.) 8/21, (A.) 17/9/21 and (F.) 22/8/48, Sheepscombe (St.) 29/6/24, Colesbourne (T.) 21/6/23. **S.** Leigh Woods (H.), Shepton Mallet (C.) 22/9/09, Vallis Vale, Frome (A.) 31/5/36, Ham Green (F.) 20/7/47. Uncommon.

ORTHONEVRA Macq. 1829 (Orthoneura auctt. *nec* Macq.)

Medium sized, dull-black flies ; eyes bare, touching in the male ; no facial knob ; apical antennal segment elongated ; upper, outer cross-vein turned back ; larvae short-tailed maggots living in mud.

nobilis Fall. 1817. **G.** Selsley (Wt.), Olveston (C.), Coombe Dingle (F.) 6/7/47. **S.** Taunton (C.), Tickenham (A.) 25/6/26, St. Audries (A.) 24/8/29, Cadbury Camp (F.) 12/5/46, West Town (F.) 286//47, Edington (F.) 5/7/47. Uncommon.

splendens Mg. 1822 (Chrysogaaster auctt.) **G.** and **S.** Fairly common.

SULCATELLA Goffe 1944 (Lejogaster Rond. 1857 *nec* Liogaster Meyer 1844)

Like Orthonevra, but apical antennal segment short ; eyes separated in both sexes ; abdomen shining metallic-black.

metallina F. 1776. **G.** and **S.** Fairly common.

CHRYSOGASTER Mg. 1800

Like ORTHONEVRA, but apical antennal segment short ; upper, outer cross-vein not turned back.

hirtella Lw. 1843. **G.** and **S.** Fairly common.

macquarti Lw. 1833. **G.** Painswick (W.), Olveston (C.). **S.** Street Heath, Sharpham (Cw.) 11/1/47, Catcott (Cw.) 19/6/47, Edington (Cw.) 27/6/47. Uncommon.

virescens Lw. 1854. **S.** Keynsham (A.) 6/29. Rare.

chalybeata Mg. 1822. **S.** Dunster (A.) 8/16. Rare.

solstitialis Fall. 1817. **G.** and **S.** Common.

CALLICERA Panz. 1806–9

Large, aeneous, bare flies ; eyes hairy, touching in the male ; antennae long, porrect, arista short, apical ; wing normal ; larvae in hollows in trees.

aenes F. 1776. **S.** Dunster (A.) 8/16. Rare.

FERDINANDEA Rond. 1844 (CHRYSOCHLAMYS Rond. 1857)

Medium-sized, aeneous, bare flies ; eyes hairy, touching in the male ; arista dorsal, almost bare ; scutellum yellow ; thorax striped ; first and second longitudinal veins reach the costa separately, third longitudinal vein almost straight ; larvae live in diseased tree-trunks.

cupraea Scep. 1763. **G.** and **S.** Common.

ruficornis F. 1775. **S.** Backwell (A.) 25/4/26. Rare.

CHILOMYIA Shan. 1922 (CHEILOSIA Mg. 1822 *nec* Panz. 1809)

Medium-sized to large, black, more or less aeneous, flies ; bare, pubescent or long-hairy ; distinct, narrow bands on either side of the face and a more or less prominent knob on the face ; eyes bare or hairy, touching in the male ; arista bare or pubescent ; wings normal, more or less darkened, larvae parasitic in stems of many Phanerogams (e.g. Thistle), some in Fungi.

llustrata Harr. 1776. **G.** Painswick (W.), Cirencester (T.), Wotton-under-Edge (P.), Oldbury Court (Wm.) 26/6/17. **S.** Weston-s-Mare (J.) 12/8/17, Shepton Mallet (C.), Leigh Woods (H.), St. Audries (A.) 19/8/29, Clevedon (A.) 15/6/40, Tickenham (A.) 19/7/42, Edington (Cw.) 26/5/43, East Harptree (Cw.) 19/7/45, Loxley Wood, Shapwick (Cw.) 2/7/47. Hairy fly with dark spot on wing ; not uncommon.

funebres Harr. 1776 (*variabilis* Panz. 1798). **G.** and **S.** Very common.

vulpina Mg. 1822. **G.** Cirencester (T.) 16/5/22, Bristol (Wm.) 9/5/20, Blaise Castle (A.) 17/9/21, Kingsweston (A.) 6/5/23, Coombe Dingle (F.) 26/5/47. **S.** Ashcott (J.) 28/8/20, Shapwick (J.) 29/6/21, Freshford (A.) 28/5/38, Loxley Wood, Shapwick (Cw.) 17/7/45, Edington (Cw.) 22/7/45 and 5/5/48, Clevedon (F.) 27/5/47, Failand (F.) 31/5/47. Uncommon.

honesta Rond. 1868. **G.** Selsley (Wt.), Cirencester (T.), Wotton-under-Edge (P.). **S.** Rodney Stoke (A.) 17/4/29, Adcombe Hill, Pitminster (Cw.) 14/6/48. Uncommon.

intonsa Lw. 1857. **G.** Kingsweston (Wm.) 16/8/22 and (A.) 4/9/24, Shepperdine (A.) 30/8/24, Durdham Down (F.) 21/9/47. **S.** Freshford (C.), Tickenham (A.) 24/4/22, Shapwick (A.) 30/8/24, St. Audries (A.) 23/8/29, Edington (Cw.) 4/5/46 and 6/7/46, Street Heath, Sharpham (Cw.) 28/8/48. Uncommon.

corydon Harr. 1776 (*grossa* Fall. 1817). **G.** Painswick (W.), Wotton-under-Edge (P.), Filton (F.) 29/3/46 and 23/3/48. **S.** Shapwick (J.) 3/4/19, Wembdon (Tr.) 3/20, Leigh Woods (F.) 6/4/46 and 12/4/47, Portbury (F.) 30/3/46. Rare.

chrysocoma Mg. 1822. **G.** Wotton-under-Edge (P.), Cranham (Wt.), Selsley (Br.) 13/5/94, Painswick (Wt.) 22/5/93. Rare.

albipila Mg. 1838 (*flavicornis* Schin. *nec* F.). **G.** Painswick (W.), Wotton-under-Edge (P.), Coombe Dingle (F.) 24/3/45. **S.** Shapwick (A.) 21/4/24 and (F.) 31/3/45, Ashcott (Wm.) 21/3/27, Blackdown (Wm.) 14/5/27, West Town (F.) 21/4/46, Leigh Woods (F.) 12/4/47, Cadbury Camp (F.) 13/4/47. Uncommon.

fraterna Mg. 1830 (*chloris* auctt. *nec* Mg.). **G.** and **S.** Fairly common.

bergenstammi Beck. 1894. **G.** and **S.** Fairly common.

impressa Lw. 1840. **G.** and **S.** Fairly common.

albitarsis Mg. 1822. **G.** and **S.** Very common.

proxima Zett. 1843. **G.** and **S.** Common.

carbonaria Egg. 1860. **G.** Cranham Wood (J. Edwards) 31/7/47. Rare.

cynocephala Lw. 1840. **S.** Batheaston (Bl.). Rare.

vernalis Fall. 1817. **G.** and **S.** Common.

velutina Lw. 1840. **S.** Shapwick (F.) 14/4/46. Rare.

mutabilis Fall. 1817. **G.** Blaise Castle (F.) 28/3/48. **S.** Freshford (C.), Portishead (H.), Leigh Woods (H.). Rare.

ruralis Mg. 1822 (*praecox* Zett. 1843). **G.** Selsley (Wt.), Cirencester (T.), Bristol (Wm.) 1920, Filton (F.) 6/4/48. **S.** Ham Green (F.) 19/4/47. Rare.

PORTEVINIA Goffe 1944 (CARTOSYRPHUS Portevin 1927 *nec* Big. 1883)

Like CHILOMYIA, but abdomen dull with greyish-white spots ; eyes bare, antennae orange, third longitudinal vein reaching edge of wing well before the apex ; facial knob small, larvae in bulbs of *Allium ursinum* L.

maculata Fall. 1817. **G.** and **S.** Common where the host plant grows and when it is in bloom.

CARTOSYRPHUS Big. 1883 (CHILOSIA auctt. *nec* Panz.)

Like PORTEVINIA, but abdomen unicolorous ; third longitudinal vein reaching edge of wing at apex of wing ; facial knob well marked ; larvae parasitic on various plants.

antiqua Mg. 1822 (*sparsus* Lw. 1857). **G.** Sheepscombe (St.) 18/6/27. Rare.

nasutulus Beck. 1894 (*antiquus* Verr. *nec* Mg., *vicinus* Lundb. *nec* Zett.). **S.** Cheddar (C.). Rare.

nigripes Mg. 1822. **G.** Coombe Dingle (F.) 19/5/47. Rare.

scutellatus Fall. 1817. **G.** and **S.** Fairly common.

longulus Zett. 1838. **G.** Bristol (C.), Kingsweston (Wm.) 16/8/22. **S.** Leigh Woods (H.), Loxley Wood, Shapwick (Cw.) 5/7/45. Uncommon.

paganus Mg. 1822 (*pulchripes* Lw. 1857). **G.** and **S.** Common.

var. *floccosus* Verr. 1901. **S.** Clevedon (A.) 27/4/45, Edington (Cw.) 7/4/46.

S. F. SYRPHINAE

CHEILOSIA Panz. 1809 (PYROPHAENA Schin. 1860)

Medium-sized, black flies with either much red (*granditarsa*) or some yellow markings (*rosarum*) on abdomen, which is flattened ; face black ; scutellum aeneous ; arista short, slightly pubescent ; eyes bare, touching in the male ; fore-tarsi much dilated (*granditarsa*) or normal (*rosarum*) in the male ; larvae live in mud.

granditarsa Först. 1771. **G.** and **S.** Fairly common.

rosarum F. 1787. **G.** Coombe Dingle (F.) 14/8/44. **S.** Porlock (C.), Ashcott (J.) 28/8/20, Shapwick (A.) 11/2/23 and (Cw.) 25/5/48, Moreton (A.) 25/5/35, Edington (Cw.) 4/8/44, Street Heath, Sharpham (Cw.) 6/9/47. Uncommon.

XANTHANDRUS Verr. 1901

Like CHEILOSIA, but abdomen ovate with extensive, orange markings ; fore-tarsi normal ; larvae green, feeding on other larvae (e.g. *Tortrix*).

comtus Harr. 1776. **G.** Durdham Down (F.) 20/9/47. **S.** Crewkerne (Sl.) 24/7/20, Banwell (J.) 29/8/22, Shapwick (A.) 3/9/22, Long Ashton (Bw.) 28/7/44, Loxley Wood, Shapwick (Cw.) 2/7/47 and (F.) 5/7/47. Uncommon.

MELANOSTOMA Schin. 1860

Like XANTHANDRUS, but abdomen narrow with parallel sides and yellow or whitish markings, which are triangular in the female ; larvae feed on Aphids.

ambiguum Fall. 1817. **G.** Bristol (C.), Filton (A.) 14/5/22, Olveston (A.) 8/4/23, Littledean (A.) 5/6/22. **S.** Portishead (H.), Backwell (A.) 18/4/27, Rodney Stoke (A.) 9/4/29, Tickenham (A.) 20/4/39, Clevedon (A.) 18/5/39 and 22/4/45, Edington (Cw.) 22/4/46. Not uncommon.

mellinum L. 1758. **G.** and **S.** Very common.

scalare F. 1774. **G.** and **S.** Very common.

PLATYCHEIRUS Lep. and Serv. 1828 (*emend.* PLATYCHIRUS Agassiz 1846)

Like MELANOSTOMA, but in the male the fore-tarsi or fore-tibiae or both are dilated, and in the female the yellow markings are quadrate.

manicatus Mg. 1822. **G.** and **S.** Common.

tarsalis Schum. 1836. **G.** Cranham (Wt.), Mangotsfield (Bw.) 14/8/43. **S.** Weston-s-Mare (J.) 17/5/22. Rare.

discimanus Lw. 1871. **G.** Wotton-under-Edge (P.). **S.** Leigh Woods (A.) 7/5/32. Rare.

timeo Harr. 1776 (*peltatus* Mg. 1822). **G.** and **S.** Common.

scutatus Mg. 1822. **G.** and **S.** Common.

albimanus F. 1781. **G.** and **S.** Very common.

podagratus Zett. 1838. **G.** Sheepscombe (St.) 21/6/25. Rare.

scambus Staeg. 1843. **G.** Wotton-under-Edge (P.). **S.** Berrow (A.) 27/8/30. Rare.

fulviventris Macq. 1829. **G.** Painswick (W.), Wotton-under-Edge (P.). **S.** Sharpham (A.) 5/8/25, Kenn Moor (A.) 29/6/41. Uncommon.

clypeatus Mg. 1822. **G.** and **S.** Fairly common.

angustatus Zett. 1843. **G.** Stroud (Wt.), Wotton-under-Edge (P.). **S.** Minehead (Bl.), Leigh Woods (A.) 22/6/25. Uncommon.

SPHAEROPHORIA Lep. and Serv. 1828

Medium-sized flies with long, narrow abdomen ; yellow stripes on pleura and yellow markings on abdomen ; face yellow ; eyes bare ; antennae yellow, arista bare ; green larvae feed on Aphids.

scripta L. 1758 var. *scripta s.str.* **G.** and **S.** Common.

var. *dispar* Lw. 1840. **G.** Bristol (A.) 6/20. **S.** Walton Moor (A.) 4/6/48.

var. *nigricoxa* Zett. 1843. **G.** Olveston (A.) 8/20. **S.** Tickenham (A.) 27/5/22, Charlwood (Cw.) 17/5/40, Edington (Cw.) 18/5/44, Cossington (Cw.) 31/7/45, Street Heath, Sharpham (Cw.) 2/6/46, Huish Episcopi (Cw.) 12/6/45.

var. *strigata* Staeg. 1845. **G.** Olveston (A.) 4/6/22, Kingsweston (A.) 6/5/23. **S.** Leigh Woods (Wm.) 31/7/20, Street Heath, Sharpham (Cw.) 11/7/45.

menthastri L. 1758, var. *menthastri s.str.* **G.** and **S.** Common.

var. *picta* Mg. 1822. **G.** Painswick (W.). **S.** Sharpham (A.) 31/7/25, Priddy (A.) 7/6/36, Clevedon (A.) 7/7/41, Edington (Cw.) 3/6/42 and 1/8/46, Catcott (Cw.) 22/5/42.

var. *philanthus* Mg. 1822. **S.** Sharpham (A.) 12/8/23.

var. *taeniata* Mg. 1822. **G.** Bristol (A.) 7/20. **S.** Edington (Cw.) 26/5/42 and 20/7/45.

ruppellii Wied. 1830 (*flavicauda* Zett. 1843) var. *ruppellii s.str.* **G.** Bristol (C.), (Wm.) and (A.) 7/20.

var. *nitidicollis* Zett. 1849. **G.** Wotton-under-Edge (P.), Bristol (C.). **S.** Nailsea (Wm.) 17/7/26.

BACCHA F. 1805

Medium-sized, black flies with long, slender abdomen which bears some yellow markings ; eyes bare, touching in the male ; arista bare ; wing normal, more or less brownish tinged ; larvae feed on Aphids ; flies found among low vegetation in damp places.

obscuripennis Mg. 1822. **G.** and **S.** Common.

elongata F. 1775. **G.** and **S.** Common.

MELANGYNA Verr. 1901

Like MELANOSTOMA, but eyes hairy and female without yellow markings on abdomen ; life-history not known.

quadrimaculata Verr. 1873. **G.** Painswick (W.), Wotton-under-Edge (P.), Kingsweston (A.) 13/3/26, Coombe Dingle (F.) 13/3/48. **S.** Freshford (C.), Brockley Combe (Wm.) 30/3/20, Leigh Woods (F.) 27/3/46. Uncommon.

STENOSYRPHUS Mats. 1917 (EPISTROPHE Szil. 1940 *nec* Wlk. 1842)

Medium-sized flies ; pale yellow with black middle line ; abdomen narrow, parallel sided with small, more or less quadrate, yellow markings ; antennae black ; larvae feed on Aphids.

labiatarum Verr. 1901. **G.** Olveston (C.), Cirencester (T.) 9/7/24, Forest of Dean (Br.), Blaise Castle (A.) 7/21. **S.** Banwell (J.), Leigh Woods (H.), Tickenham (A.) 25/6/26, Loxley Wood, Shapwick (Cw.) 5/7/45 and 26/6/48, Edington (Cw.) 20/6/48. Not uncommon.

umbellatarum F. 1794. **G.** and **S.** Fairly common.

compositarum Verr. 1873. **G.** Olveston (A.) 7/20, Kingsweston (A.) 6/7/24. **S.** Cheddar (C.), Leigh Woods (H.), Shapwick (Wm.) 26/6/21. Uncommon.

lasiophthalmus Zett. 1845. **G.** and **S.** Fairly common in early spring.

MESOSYRPHUS Mats. 1917 (DASYEPISTROPHE Szil. 1940)

Like STENOSYRPHUS, but abdomen ovate and spots on abdomen longer, almost forming bands.

punctulatus Verr. 1873. **G.** and **S.** Fairly common.

vittiger Zett. 1843. **G.** Kingsweston (A.) 3/5/23. Rare.

EPISYRPHUS Mats. 1917 (HETEREPISTROPHE Szil. 1940)

Like STENOSYRPHUS, but face wholly yellow ; abdomen with large, yellow spots or bands ; antennae more or less yellow.

triangulifer Zett. 1843. **G.** Painswick (W.), Stroud (Br.), Selsley (Br.) 13/5/94. Coombe Dingle (F.) 11/5/45, Henbury (Lw.) 27/4/44. Rare.

euchromus Kow. 1885. **G.** Coombe Dingle (F.) 2/5/46 and (Lw.) 3/5/44. **S.** Clevedon (F.) 7/5/49. Uncommon.

auricollis Mg. 1822, var. *auricollis s.str.* **G.** Painswick (W.) Wotton-under-Edge (P.) Cirencester (T.). **S.** Shepton Mallet (C.), Freshford (C.), Tickenham (A.) 23/6/29, Minehead (Bl.), Edington (Cw.) 27/7/44. Uncommon.

var. *maculicornis* Zett. 1843. **G.** and **S.** Common.

var. *nigritibia* Rond. 1857. **G.** Coombe Dingle (F.) 13/3/48, Filton (F.) 12/2/48. **S.** Failand (F.) 31/3/46. Uncommon.

cinctus Fall. 1817. **G.** Cranham (Wt.), Cirencester (T.), Westbury-on-Trym (Wm.) 27/8/22. **S.** Leigh Woods (Wm.) 21/9/19 and (A.) 22/5/27, Loxley Wood, Shapwick (Cw.) 6/5/48. Uncommon.

cinctellus Zett. 1843. **G.** and **S.** Common.

balteatus Deg. 1776. **G.** and **S.** Very common, the only species with two light bands on each abdominal segment.

CHRYSOTOXUM Mg. 1803

Large, handsome, bare flies with yellow markings on thorax, pleura and abdomen ; eyes hairy, touching in the male ; antennae long, porrect, arista bare, third longitudinal vein with slight hollow ; larvae may live in rotten wood.

S. G. PRIMOCHRYSOTOXUM Shann. 1926

cautum Harr. 1776. **G.** and **S.** Fairly common.

arcuatum L. 1758. **G.** Bristol (C.). **S.** Wellington (Bl.), Cheddar (C.). Rare.

S. G. CHRYSOTOXUM *s.str.*

latilimbatum Coll. 1940 (*elegans* Verr. *nec* Lw.). **S.** Clevedon (A.) 1 /8 /40 and 12 /6 /47, Loxley Wood, Shapwick (Cw.) 4 /7 /45. Uncommon.

elegans Lw. 1841. **G.** Clifton (G.) 9 /17. **S.** Weston-s-Mare (Wm.) 7 /8 /20, Tickenham A.) 26 /6 /24, Clevedon (A.) 7 /8 /40. Uncommon.

festivum L. 1758. **G.** Kingsweston (A.) 7 /21, Hallen (A.) 12 /7 /24. **S.** Weston-s-Mare (J.), Freshford (C.), Minehead (Bl.), Dunster (A.) 8 /16, Tickenham (A.) 26 /6 /24, Clevedon (A.) 27 /7 /40, Loxley Wood, Shapwick (Cw.) 5 /7 /47, Street Heath, Sharpham (Cw.) 27 /7 /47, Edington (Cw.) 16 /7 /48. Fairly common.

bicinctum L. 1758. **G.** and **S.** Common.

XANTHOGRAMMA Schin. 1860

Medium-sized, bare flies with bright yellow markings on thorax, pleura and abdomen ; eyes almost bare, touching in the male ; face yellow with central knob ; antennae not porrect, arista bare ; larvae feed on Aphids.

citrofasciatum Deg. 1776. **G.** Bristol (C.), Wotton-under-Edge (P.), Kingsweston (Wm.) 20/5/22 and (A.) 8 /6 /26, Filton (F.) 30/5/46, Coombe Dingle (F.) 18/5/48. **S.** Ebbor (J.) 22 /5/19, Midsomer Norton (H.) 31 /5/19, Nailsea (Wm.) 25/5/21, Clevedon (A.) 13 /6 /41, Edington (Cw.) 14/6 /49. Uncommon.

pedisequum Harr. 1776 (*binatum* Mg. 1822). **G.** Olveston (A.) 8 /18 and 2 /9 /23, Bristol (A.) 6 /7 /33. **S.** Minehead (Bl.), Shepton Mallet (C.) and (A.) 23 /6 /42, Tickenham (A.) 26 /6 /24, Backwell (A.) 18 /5/27, Clevedon (A.) 16 /7 /40, Chilton Polden (Cw.) 16 /6 /42, Edington (Cw.) 19/5/42 and 29 /6 /46. Not uncommon.

DOROS Mg. 1803

Like XANTHOGRAMMA, but large, slightly hairy ; abdomen very long, constricted at base ; life-history unknown.

conopseus F. 1775. **S.** Cossington (Cw.) 15 /6 /44, Loxley Wood, Shapwick (Cw.) 19 /6 /44. Rare.

DIDEA Macq. 1834

Fairly large, bare flies with yellow markings only on abdomen ; third longitudinal vein looped ; eyes slightly hairy ; apical antennal segment long, arista bare ; face yellow with slight central knob ; no fringe of hairs below scutellum ; larvae probably feed on Aphids.

fasciata Macq. 1834. **G.** Coombe Dingle (F.) 8 /5 /48 and 14 /5 /49. **S.** Minehead (Bl.), Weston-s-Mare (J.) 13 /9 /20, Lox.ey Wood, Shapwick (Cw.) 7 /5 /42 and 2 /7 /48. Rare.

PARAGUS Lat. 1804

Small, black, bare flies ; face yellow and black, eyes pubescent, arista short, bare ; flies in dry sandy situations ; larvae feed on Aphids.

tibialis Fall. 1817. **G.** Bristol (C.), Ebley (W.), Olveston (A.) 6 /20, Clifton Down (A.) 7 /21, Coombe Dingle (F.) 2 /8 /44. **S.** Kewstoke (Wt.), Nailsea (Wm.) 22 /7 /22, Clevedon (A.) 2 /7 /41, Cossington (Cw.) 25/5/45, Holford (Cw.) 30 /8 /47, Edington (Cw.) 24 /6 /48, Walton Moor (F.) 29 /8 /48.

SYRPHUS F. 1775 (LEUCOZONA Schin. 1860)

Medium-sized, rather hairy, dark fly with one wide, pale, semi-transparent band at base of abdomen ; eyes hairy ; face yellow with black middle line, wing normal with a dark, vertical band about the middle ; life-history unknown.
lucorum L. 1758. **G.** and **S.** Fairly common.

ISCHYROSYRPHUS Big. 1882

Fairly large, slightly hairy flies ; face yellow ; abdomen broad with three pairs of whitish spots ; eyes hairy ; larvae probably feed on Aphids.

glaucius L. 1758. **G.** Olveston (A.) 7/20. **S.** Cheddar (C.), Leigh Woods (H.), Brockley Combe (A.) 31/8/33, Rookham Wood, Wells (Cw.) 24/7/45, Oakhill (Cw.) 29/6/47, Loxley Wood, Shapwick (Cw.) 28/8/48. Uncommon.

laternarius Müll. 1776. **G.** and **S.** Fairly Common.

SCAEVA F. 1805 (LASIOPTHICUS Rond. 1845, CATABOMBA D.S. 1897)

Fairly large fly with a prominent, white, inflated frons ; abdomen with whitish markings (exc. *unicolor*) ; eyes hairy ; larvae feed on Aphids.
pyrastri L. 1758. **G.** and **S.** Common.

var. *unicolor* Curt. 1838. **G.** Kingsweston (A.) 6/20, Hallen (B.) 30/7/30, Blaise Castle (F.) 23/8/44, Filton (F.) 13/10/44. **S.** Weston-s-Mare (J.), Sharpham (A.) 6/8/23, Loxley Wood, Shapwick (Cw.) 29/7/48. Uncommon.

selenitica Mg. 1822. **G.** Stroud (Wt.), Hallen (Go.) 1/8/29. **S.** Cannington (Sl.) 20/7/20, Clevedon (W.), Weston-s-Mare (J.) 5/7/20, Street Heath, Sharpham (Cw.) 2/6/46. Uncommon.

METASYRPHUS Mats. 1917 (SYRPHUS auctt. *nec* F. *p.p.*)

Medium-sized, slightly hairy flies with yellow spots or bands on the ovate abdomen ; eyes bare ; face yellow with a central knob ; scutellum with fringe of hairs below the margin ; third longitudinal vein almost straight and ending some distance above the apex of the wing ; larvae feed on Aphids.

latifasciatus Macq. 1828. **G.** and **S.** Fairly common.

nitens Zett. 1843. **G.** Stroud (Wt.), Forest of Dean (Y.), Olveston (A.) 2/7/22. **S.** Portishead (Bt.). Rare.

consisto Harr. 1776 (*corollae* F. 1794). **G.** and **S.** Very common.

lundbecki Royen 1946 (*arcuatus* auctt. *nec* Fall.). **G.** Painswick (C.). Rare.

luniger Mg. 1822. **G.** and **S.** Common.

latilunulatus Coll. 1931. **S.** Sharpham (A.) 11/8/23, Edington (Cw.) 5/8/44.

DASYSYRPHUS End. 1938 (SYRPHELLA Goffe 1944, SYRPHUS auctt. *nec* F.)

Like METASYRPHUS, but eyes hairy and third longitudinal vein ending exactly at apex of wing.

albostriatus Fall. 1817. **G.** and **S.** Fairly common.

var. *confusus* Egg. 1860. **G.** Clifton Down (A.) 8/20. **S.** Tickenham (A.) 19/6/25, Clevedon (A.) 23/8/39 and 15/8/44.

tricinctus Fall. 1817. **G.** Olveston (C.) 5/16, Kingsweston (A.) 9/6/23. **S.** Leigh Woods (A.) 22/5/27, Clevedon (A.) 6/8/40, Loxley Wood, Shapwick (Cw.) 19/5/47 and 29/7/48, Street Heath, Sharpham (Cw.) 28/8/48, Sharpham (A.) 7/8/23, Portishead (Bt.). Not uncommon.

arcuatus Fall. 1817 (*venustus* Mg. 1822). **G.** Blaise Castle (A.) 28/5/27, Damery (A.) 7/6/30, Dursley (A.) 18/5/30. **S.** Leigh Woods (H.) and (A.) 22/5/26, Shapwick (A.) 20/5/23, Freshford (A.) 28/5/38, Clevedon (A.) 14/5/27 and 11/5/44, Compton Dando (Cw.) 8/6/42, Edington (Cw.) 20/5/44, Loxley Wood, Shapwick (Cw.) 26/5/47. Fairly common.

lunulatus Mg. 1822. **G.** Painswick (W.), Cirencester (T.) 7/6/23, Hallen (B.) 19/6/26. **S.** Minehead (Bl.), Freshford (C.), Cheddar (C.). Uncommon.

SYRPHIDIS Goffe 1933 (SYRPHUS auctt. *nec* F. *p.p.*)

Like DASYSYRPHUS, but third longitudinal vein reaching edge of wing just above the apex of the wing.

annulipes Zett. 1838. **G.** Selsley (Wt.), Coombe Dingle (Lw.) 19/5/47. **S.** West Town (F.) 21/4/46. Rare.

torvus D.S. 1875 (*topiarius* Schin. *nec* Mg.). **G.** and **S.** Fairly common.

ribesii L. 1758. **G.** and **S.** Very common.

vitripennis Mg. 1822. **G.** and **S.** Very common.

nitidicollis Mg. 1822. **G.** Wotton-under-Edge (P.), Blaise Castle (Wm.) 2/5/25, Hallen (A.) 19/6/26, Dursley (A.) 9/6/25. **S.** Leigh Woods (H.), Sharpham (A.) 7/8/25, Loxley Wood, Shapwick (Cw.) 26/5/47. Not uncommon.

EPISTROPHE Wlk. 1852 (EURYEPISTROPHE Szil. 1940)

Like SYRPHIDIS, but eyes bare.

elegans Harr. 1776 (*bifasciata* F. 1794). **G.** and **S.** Very common.

grossulariae Mg. 1822. **G.** and **S.** Fairly common.

diaphana Zett. 1843. **G.** Coombe Dingle (F.) 7/6/48, Filton (F.) 2/7/48 and 10/6/49. **S.** Nailsea (J.) 20/6/22; West Town (Wm.) 2/5/26, Edington (Cw.) 20/6/48. Uncommon.

Division :—SCHIZOPHORA

Lunule distinct and horse-shoe shaped.

Subdivision :—ACALYPTERAE

Squamae small or absent ; thorax without transverse suture ; second antennal segment not split.

Family :—**Conopidae**

Wasp-like, black or black and yellow flies ; antennae porrect and composed of three segments ; proboscis long and thin, often geniculate ; squamae small or absent ; abdomen long, pear-shaped in the male, parallel-sided in the female and in this sex bearing a protuberance on the underside near the apex ; wing as in SYRPHIDAE, but vena spuria not always present ; larvae parasitic on Hymenoptera Aculeata.

S. F. CONOPINAE

Ocelli absent ; arista short and apical.

CONOPS L. 1758

Proboscis long, geniculate, femora somewhat swollen ; abdomen not excessively constricted at the base.

S. G. CONOPS *s.str.*

vesicularis L. 1761. **G.** Moorend (Bw.) 4/8/45. **S.** Long Ashton (Bw.) 3/8/45, Burrington Combe (F.) 8/8/46. Uncommon, parasitic on *Bombus muscorum* L.

quadrifasciatus Deg. 1776. **G.** and **S.** Fairly common, parasitic on *Bombus* spp.

flavipes L. 1758. **S.** Dunster (A.) 8/16, Sharpham (A.) 5/8/23, St. Audries (A.) 20/8/29, Burrington Combe (F.) 4/8/36, Leigh Woods (F.) 5/8/44, Loxley Wood, Shapwick (Cw.) 4/7/45. Not uncommon, parasitic on *Osmia* spp. and *Bombus* spp.

S. G. CONOPILLA Rond. 1845

ceriaeformis Mg. 1824. **S.** Leigh Woods (H.). Very rare.

LEOPOLDIUS Rond. 1843 (BRACHIGLOSSUM Rond. 1856)

Like CONOPS, but proboscis short and thick.

signatus Wied. 1824 (*erostratus* Rond. 1844, *brevirostris* Beck. *nec* Germ.). **S.** Clevedon (A.) 27/9/42. Very rare, probably parasitic on *Vespula* spp.

PHYSOCEPHALA Schin. 1861

Like Conops, but mainly black, and abdomen much constricted at the base upper part of wing darkened.

rufipes Deg. 1776. **G.** and **S.** Not uncommon, parasitic on *Bombus* spp.

S. F. Myopinae

Ocelli present; arista short, dorsal.

THECOPHORA Rond. 1845 (Occemyia R.D. 1853, Oncomyia Lw. 1866)

Small, black flies; proboscis doubly geniculate; jowls below eyes narrow; antennae longer than the frons, which is partly black; probably parasitic on *Halictus* spp.

atra F. 1781. **G.** Painswick (W.), Olveston (C.) 29/9/14, Durdham Down (F.) 16/9/44. **S.** Clevedon (A.) 23/8/40, Tickenham (B.) 20/7/42, Cadbury Camp (F.) 12/7/47. Uncommon.

pusilla Mg. 1824. **G.** Stroud (Wt.), Filton (F.) 10/10/44 and 16/7/48. **S.** Shepton Mallet (C.) 17/8/09. Uncommon.

SICUS Scop. 1763

Fairly large, brown fly; antennae shorter than the frons, which is yellow; parasitic on *Bombus* spp.

ferrugineus L. 1761. **G.** and **S.** Fairly common.

MYOPA F. 1775

Medium-sized, brown flies; proboscis doubly geniculate; jowls below eyes wide, whitish and hairy; wings darkened and more or less spotted; parasitic on *Bombus* spp., *Eucera* spp. and *Colletes* spp.

buccata L. 1758. **G.** and **S.** Not uncommon.

testacea L. 1767. **G.** and **S.** Fairly common.

polystigma Rond. 1857. **G.** Painswick (W.), Cirencester (T.) 14/5/23, Olveston (C.) 28/4/14. **S.** Moreton (A.) 17/5/32, Clevedon (A.) 15/5/43, Edington (Cw.) 25/4/44 and 6/5/47. Uncommon.

Family :—**Platystomidae**

Head large; eyes separate in both sexes; mouth large; wing normal; larvae saprophagous; flies found in damp herbage.

PLATYSTOMA Mg. 1803

Medium-sized fly; body dark-brown with black dots, wing dark with clear spots; fourth longitudinal vein reaches edge of wing at the apex of the wing.

seminationis L. 1761. **G.** Wotton-under-Edge (P.), Hanham (A.) 19/6/22, Coombe Dingle (F.) 15/6/46. **S.** Freshford (C.), Taunton (H.), Nailsea (H.), Tickenham (A.) 6/21, Ashcott (Bt.), Whitchurch (A.) 27/5/35, Clevedon (A.) 22/7/41, Edington (Cw.) 21/6/46 and (F.) 5/7/47. Fairly common.

RIVELLIA R.D. 1830

Small, shining, blue-black flies; hind-tarsi fulvous, wing clear with dark base and apex and two narrow, dark, vertical bands.

syngenesiae F. 1781. **S.** Shapwick (A.) 10/7/23. Apparently uncommon.

Family :—**Otitidae** (Ortalididae)

Medium-sized to small flies; wing clear or spotted, fourth longitudinal vein ending below the apex of the wing; apical antennal segment pointed; flies found in damp herbage; life-history uncertain.

DORYCERA Mg. 1830

Medium-sized; antennae long and porrect; profile of head triangular; wing darkened at base and apex; only one prescutellar pair of bristles on thorax.

gramineum F. 1775. **G.** Bristol (C.), Wotton-under-Edge (P.). **S.** Withycombe (Sl.). Rare.

OTITES Lat. 1804

S. G. PTILONOTA Lw. 1868

Small fly ; antennae short ; head square in profile ; wing with many dark patches on the veins, several pairs of bristles on thorax.

guttata Mg. 1830. **G.** Olveston (C.), Blaise Castle (A.) 6/21, Kingsweston (A.) 1/5/26, Coombe Dingle (F.) 7/6/48, Filton (F.) 9/5/49. **S.** Leigh Woods (H.) and (A.) 22/5/27, Prior Park, Bath (A.) 20/5/29, Backwell (A.) 13/5/34, Cadbury Camp (F.) 12/5/46, Freshford (C.), Portishead (Bt.). Not uncommon.

MELIERIA R.D. 1830 (CEROXYS Macq. 1835 *p.p.*)

Like PTILONOTA, but wings clear with about five very dark patches ; apical antennal segment concave ; fourth longitudinal vein straight.

crassipennis F. 1794 (*gangraenosa* R.D. 1830). **S.** Shapwick (A.) 6/21, Tadham Moor, Wedmore (Cw.) 23/7/47, Edington (Cw.) 22/5/48. Uncommon.

omissa Mg. 1826. **G.** Hallen (A.) 1/8/29. **S.** Weston-s-Mare (J.). Rare.

picta Mg. 1826. **G.** Wotton-under-Edge (P.), St. Vincent's Rocks, Clifton (Curtis). Rare.

CEROXYS Macq. 1835

(ORTALIS Fall. 1810 *preoc.*, MECKELIA R.D. 1830 *preoc.*, ANACAMPTA Lw. 1868)

Like MELIERIA, but wings with three dark stripes, a dark spot at apex and fourth longitudinal vein curved upwards.

urticae L. 1758. **S.** Taunton (A.) 5/5/48, Street Heath, Sharpham (F.) 22/5/49. Uncommon.

HERINA R.D. 1830 (PTEROPAECTRIA Lw. 1868, LOXODESMA Lw. 1868)

Like MELIERIA, but small flies with wing markings different and differing in each species ; apical antennal segment long and straight.

frondescentiae L. 1758. **G.** Bristol (C.), Filton (F.) 1/7/47. **S.** Sharpham (A.) 28/7/23 and (St.) 31/5/36, Shapwick (A.) 17/6/23 and 29/6/29, Edington (Cw.) 6/7/47. Not uncommon.

palustris Mg. 1826. **G.** Tormarton (A.) 13/8/29, Bristol (F.) 14/7/48. **S.** Shapwick (A.) 28/5/23. Uncommon.

oscillans Mg. 1826. **G.** Tormarton (A.) 13/8/29. Rare.

lacustris Mg. 1826. **G.** Wotton-under-Edge (P.). **S.** Cheddar (W.). Rare.

lugubris Mg. 1826 (*afflicta* Mg. 1830). **G.** Hallen (B.) 11/7/29. **S.** Shepton Mallet (C.), Pensford (H.), Wells (L.), Tickenham (A.) 28/7/22, St. Audries (A.) 1/9/29. Not uncommon.

germinationis Rossi 1790 (*nigrina* Mg. 1826). **G.** Hallen (A.) 1/8/29, Stroud (Fl.) 11/8/43, Filton (F.) 2/7/48, Bristol (F.) 14/7/48. **S.** Taunton (Pa.), Leigh Woods (H.), Wells (L.), Tickenham (A.) 20/7/23, Clevedon (A.) 19/7/42. Fairly common.

SEIOPTERA Kirby 1817 (SEOPTERA Lw. 1868)

(N.B. Placed by some authors in ULIDIIDAE)

Small, black, shining flies, wing iridescent with a deep-black spot at apex, first longitudinal vein bare (N.B. it is more or less setulose in the foregoing genera), third and fourth longitudinal veins converging, two sternopleural bristles (N.B. only one in the foregoing genera) ; flies are predatory ; life history unknown.

vibrans L. 1758. **G.** Bristol (B.) 3/6/28, Stone (A.) 26/6/28, Morton (F.) 11/7/47, Coombe Dingle (F.) 4/6/49. **S.** Tickenham (A.) 22/6/32, Priddy (A.) 6/6/37, Shepton Mallet (A.) 23/6/42, Edington (Cw.) 7/8/46 and 14/7/48, Leigh Woods (F.) 5/6/49. Fairly common.

Family :—**Pallopteridae** (LONCHAEIDAE *p.p.*)

Small, yellow flies, wing usually spotted or banded ; fore- and hind-tibiae without a preapical bristle ; presutural dorso-central bristles present ; flies in low vegetation ; larvae saprophagous or parasitic on plants.

PALLOPTERA Fall. 1820

Wing with dark edging and in some species darkened cross-veins.

ustulata Fall. 1820. **G.** Wotton-under-Edge (P.), Kingsweston (A.) 7/20, Stone (A.) 27/6/28, Stroud (Fl.) 19/8/39, Morton (F.) 11/7/47, Durdham Down (F.) 12/9/46, Coombe Dingle (F.) 26/6/48. **S.** Shepton Mallet (C.), Wells (L.), Kenn Moor (A.) 16/6/39, Clevedon (A.) 26/7/40, Ham Green (F.) 7/7/46, Axbridge (Cw.) 25/6/47, Edington (Cw.) 4/6/47. Common.

saltuum L. 1758. **G.** Wotton-under-Edge (P.), Filton (F.) 6/6/47, Coombe Dingle (F.) 26/7/47. **S.** Failand (F.) 31/5/47, Loxley Wood, Shapwick (Cw.) 5/7/47. Not uncommon.

gangraenosa Panz. 1793 (*umbellatarum* auctt. *nec* F.). **G.** Wotton-under-Edge (P.), Bristol (A.) 17/6/35, Coombe Dingle (F.) 17/6/44, Durdham Down (F.) 4/9/47, Blaise Castle (F.) 17/7/48. **S.** Nailsea (C.), Pensford (H.). Not uncommon; larvae in capitula of *Carlina vulgaris* L. and *Cnicus lanceolatus* Scop.

parallela Lw. 1859 (*umbellatarum* Mg. *nec* F.). **G.** Hallen (A.) 1/8/29. **S.** Clevedon (A.) 23/7/40, Loxley Wood, Shapwick (Cw.) and (F.) 28/8/48. Not uncommon; larvae in same plants as *gangraenosa*.

campta Cz. 1934 (*arcuata* auctt. *nec* F.). **G.** Wotton-under-Edge (P.), Olveston (C.), Dursley (A.) 9/6/25, Tockington (A.) 19/4/27, Coombe Dingle (F.) 15/6/47. **S.** Leigh Woods (H.), Chewstoke (A.) 24/5/33 and 23/6/34, Portishead (F.) 24/5/47, Portbury (F.) 31/5/47, Edington (Cw.) 9/6/47. Not uncommon.

trimacula Mg. 1826. **G.** Awkley (A.) 1/9/23, Shepperdine (A.) 23/8/24, Coombe Dingle (F.) 7/9/46. Uncommon.

ambusta Mg. 1826. **G.** Blaise Castle (F.) 5/7/48, Coombe Dingle (F.) 10/6/47 and 6/7/47. Rare.

TOXONEURA Macq. 1835 (OCNEROS Costa 1844)

A dark-brown band runs all round the edge of the wing.

muliebris Harr. 1776 (*pulchella* Rossi 1790, *fasciata* Macq. 1835). **G.** Olveston (C.) and (A.) 5/9/22, Bristol (B.) 9/6/25 and (A.) 19/7/26 and 10/9/36, Stone (A.) 27/6/28, Thornbury (F.) 14/7/35, Durdham Down (F.) 28/8/46. **S.** Shepton Mallet (C.), Leigh Woods (H.), West Town (Wm.) 9/26. Clevedon (A.) 22/7/45, Edington (Cw.) 3/8/46. Not uncommon, sometimes indoors in windows; larvae live under bark of trees and probably feed on frass of other insects.

Family :—**Lonchaeidae**

Small, shining, blue-black flies with clear wings; presutural dorso-central bristle present; one pair of fronto-orbital bristles; no preapical bristles on tibiae; larvae saprophagous, often under loose bark of trees.

LONCHAEA Fall. 1820

S. G. SPERMATOLONCHAEA Hend. 1932

flavidipennis Zett. 1847. **G.** and **S.** Common.

S. G. LONCHAEA *s.str.*

chorea F. 1781. **G.** and **S.** Common.

deutschi Zett. 1838. **G.** Shepperdine (A.) 5/7/24). **S.** Sharpham (A.) 31/7/25. Rare.

tarsata Fall. 1820. **S.** Wells (L.), Sharpham (A.) 31/7/25. Rare.

scutellaris Rond. 1874. **S.** Clevedon (A.) 13/7/40 and 24/7/44, Shepton Mallet (A.) 7/8/42. Uncommon.

laticornis Mg. 1826. **G.** Kingsweston (A.) 6/5/24. Rare.

Family :—**Piophilidae**

Small, shining, black flies; wings clear, third and fourth longitudinal veins parallel; vibrissae present; flies in low herbage; larvae saprophagous, that of *P. casei* in cheese and bacon.

PIOPHILA Fall. 1810

casei L. 1758. **G.** Painswick (W.), Bristol (C.) and (B.) 3/8/26 and (A.) 23/9/26. **S.** St. Audries (A.) 26/8/29, Long Ashton (Bch.). Fairly common.

nigriceps Mg. 1826. **S.** Taunton (Pa.), Berrow (A.) 27/8/24, Shapwick (A.) 31/8/24. Uncommon.

nigricornis Mg. 1826. **S.** Clevedon (W.). Rare.

nigrimana Mg. 1826. **G.** Coombe Dingle (F.) 2/6/47, Chalford (F.) 15/7/47. Uncommon.

varipes Mg. 1830. **G.** Blaise Castle (A.) 15/5/26, Filton (F.) 7/10/46. Uncommon.

luteata Hal. 1833. **S.** Shapwick (A.) 14/8/25. Rare.

vulgaris Fall. 1820. **G.** Blaise Castle (F.) 15/4/49. **S.** Clevedon (A.) 18/4/39 and 14/4/45. Fairly common.

Family :—**Ulidiidae**

Like Piophila, but third and fourth longitudinal veins converging and no vibrissae.

PHYSIPHORA Fall. 1810 (Chrysomyza Fall. 1817)

Antennae not in a pit ; carina present on face.

demandata F. 1798. **G.** Mangotsfield (Bw.) 25/8/45, Brentry (F.) 6/10/47, Durdham Down (F.) 26/9/47. Uncommon.

ULIDIA Mg. 1826

Antennae in a pit ; face with carina.

erythrophthalma Mg. 1826. **G.** Bristol (C.), Cirencester (T.) 17/8/23. **S.** Pensford (Ch.) 7/6/25. Uncommon.

Family :—**Dryomyzidae** (Sciomyzidae *p.p.* Coelopidae *p.p.*)

Large flies with projecting mouth and wide, long wings ; larvae saprophagous.

DRYOMYZA Fall. 1820

Yellow fly, no presutural dorso-central bristles ; wings clear, first longitudinal vein bare

flaveola F. 1794. **G.** and **S.** Common, especially in spring.

var. *zawadskii* Schum. 1834. **G.** and **S.** Common, especially in autumn ; darker form of *flaveola*.

NEUROCTENA Rond. 1868

Like Dryomyza, but first longitudinal vein setulose, apices of longitudinal veins and cross-veins darkened.

anilis Fall. 1820. **G.** and **S.** Common.

HELCOMYZA Curt. 1825 (Actora Mg. 1826)

Like Neuroctena, but grey and brown, rather hairy fly, with short spines on costa of wing, all other veins bare ; larvae live in decomposing seaweed.

ustulata Curt. 1825 (*aestuum* Mg. 1826). **S.** Berrow (Cw.) and (F.) 27/8/49. Not uncommon.

Family :—**Neottiophilidae**

NEOTTIOPHILUM Ffld. 1868

Like Neroctena, but dark spots at apices of longitudinal veins extend back along the veins ; larvae in birds' nests, possibly ectoparasites on fledglings.

praeustum Mg. 1826. **G.** Painswick (W.), Wotton-under-Edge (P.). **S.** Flax Bourton (H.), Edington (Cw.) 19/5/42. Uncommon.

Family :—**Trypetidae**

Medium-sized to small flies, usually with banded or latticed wings, first longitudinal vein (R.) turned up suddenly at apex, the lower basal cell often prolonged in a point along the anal vein ; no preapical bristles on the tibiae ; female ovipositor long ; larvae parasitic on plants, often causing galls ; the most usual hosts are given for each species.

UROPHORA R.D. 1830 (EURIBIA auctt. *nec* Mg. 1800)

Black, somewhat shining, flies with fulvous legs ; wing with four dark bands costa reaching beyond apex of wing, lower basal cell not pointed ; larvae cause galls in capitula of Compositae.

cardui L. 1758. **G.** Wotton-under-Edge (P.), Bristol (Bu.) 16/5/48. **S.** Long Ashton (R.) 6/9/03. Uncommon. *Cnicus arvensis* L.

stylata F. 1775. **G.** Hallen (A.) 13/6/25 and (B.) 23/7/27, Dursley (A.) 15/7/31, Stroud (Fl.) 4/7/40 and 28/6/43, Filton (F.) 24/6/47. **S.** Crook Peak (Rd.), Sharpham (A.) 28/8/23, Tickenham (A.) 1/7/33, Clevedon (A.) 25/7/42 and 20/6/43. Fairly common. *Cnicus lanceolatus* L.

solstitialis L. 1758. **S.** Cheddar (F.) 6/8/35, Loxley Wood, Shapwick (Cl.) 29/7/48. Uncommon. *Cnicus* spp. and *Centaures* spp.

jaceana Hering 1935. **G.** Hallen (B.) 11/7/29. **S.** Loxley Wood, Shapwick (Cw.) 28/8/48. Uncommon. *Centaurea nigra* L.

aprica Fall. 1820. **G.** Wotton-under-Edge (P.), Olveston (C.). **S.** Minehead (Bl.). These records need confirmation.

RHACOCHLAENA Lw. 1862

Black fly with yellow scutellum and six large spots on the wing.

toxoneura Lw. 1846. **S.** Leigh Woods (H.). Rare. Life history unknown.

RHAGOLETIS Lw. 1862

Like RHACOCHLAENA, but four dark bands and no spots on the wing.

cerasi L. 1758. **G.** Bristol (C.) 7/12. Bred from imported fruits.

ZONOSEMA Lw. 1862

Yellow fly with four weak bands on the wing.

alternata Fall. 1820. **G.** Olveston (C.) 8/18. Rare. Fruits of *Rosa canina* L.

SPILOGRAPHA Lw. 1862 (EURIBIA Mg. *nec* Lat., TRYPETA auctt. *nec* Mg.)

Fulvous flies with dark apical spot and various other spots on the wing.

zoë Mg. 1826. **G.** and **S.** Fairly common. Leaves of various Compositae.

artemisiae F. 1794. **G.** Mangotsfield (Bw.) 25/8/45. **S.** Clevedon (A.) 23/8/40. Uncommon. Leaves of *Artemisia vulgaris* L. and *Tanacetum vulgare* L.

immaculata Macq. 1835 (*hamifera* Lw. 1846). **S.** Leigh Woods (F.) 20/7/47. Rare. Leaves of *Senecio vulgaris* L.

GONIOGLOSSUM Rond. 1863

Fulvous fly with H-shaped dark mark at the base and an inverted V-shaped mark in the fore-part of the wing.

wiedmanni Mg. 1826. **S.** Wraxall (F.) 28/6/36. Rare. Fruits of *Bryonia dioica* Jacq.

PHAGOCARPUS Rond. 1870 (ANOMOIA Wlk. 1835 *preoc.*)

Fulvous fly with a dark base and crescent-shaped, dark band in fore-part of the wing.

permundus Harr. 1776 (*antica* Wied. 1830). **G.** Rodborough (Fl.) 2/6/36, Durdham Down (F.) 4/9/47. **S.** Clevedon (A.) 5/8/40 and 26/8/44. Uncommon. Fruits of *Crataegus oxyacantha* L.

PRIONIMERA Rond. 1861 (ACIDIA R.D. 1830 *preoc.*)

Fulvous fly with dark apex and three slanting, dark bands in the wing.

cognata Wied. 1817. **G.** Rodborough (Fl.) 22/9/33 and 7/9/35, Coombe Dingle (F.) 26/6/47, Filton (F.) 7/7/47. **S.** Dunster (A.) 8/16, Priddy (F.) 18/8/35. Uncommon. Leaves of *Tussilago farfara* L. and *Petasites* spp.

PHILOPHYLLA Rond. 1870

Like PRIONIMERA, but wing bands wider and darker and with a clear spot in the basal band.

heraclei L. 1758 var. *onopordinis* F. 1781 and var. *centaureae* F. 1794. **G.** and **S.** Both vars. equally common and both bred from the same plant; *onopordinis* is fulvous, *centaureae* is black. Leaves of *Heracleum sphondylium* L., *Smynnium clusatrum* L., *Anthriscus sylvestris* Hoff., *Apium graveolens* L. and *Pastinaca sativa* L.

EULEIA Wlk. 1835 (MYOLEJA Rond. 1856)

Like PHILOPHYLLA *onopordinis*, but no clear spot in basal band of wing.

caesio Harr. 1776 (*lychnidis* F. 1787). **G.** Painswick (W.), Wotton-under-Edge (P.), Stone (A.) 28/7/28, Rodborough (Fl.) 12/7/33, Coombe Dingle (F.) 6/7/47, Blaise Castle (F.) 3/7/48. **S.** Leigh Woods (H.), Sharpham (A.) 28/8/25, Clevedon (A.) 21/6/40, Berrow (F.) 20/8/37, Walton Moor (F.) 5/6/48, Edington (Cw.) 15/7/48. Not uncommon. Life history unknown, probably *Lychnis* spp.

CRYPTACIURA Hend. 1927

Black fly with yellow markings on pleura, apex of wing broadly darkened, the darkening carried along middle of the wing to the base and with narrow, dark branches to upper and lower edges of the wing.

rotundiventris Fall. 1810. **G.** Chalford (Fl.) 26/6/48. Rare. Life-history unknown.

CERAJOCERA Rond. 1856 (CERIOCERA Rond. 1870)

Yellow fly with two rows of black spots on abdomen, four moderately dark stripes on the wing.

ceratocera Hend. 1913 (*cornuta* F. *nec* Scop.). **G.** Wotton-under-Edge (P.), Bristol (C.). **S.** Tickenham (K.) 22/7/23. Rare. Capitulum of *Centaurea scabiosa* L.

TERELLIA R.D. 1830

Like CERAJOCERA, but wings either clear (*serratulae*) or with slight darkening of the cross-veins (*longicauda.*).

serratulae L. 1758. **G.** Shepperdine (A.) 2/8/24, Rodborough (Fl.) 13/7/40, Filton (F.) 1/6/48. **S.** Sharpham (A.) 6/8/23, Clevedon (A.) 25/7/42, Loxley Wood, Shapwick (Cl.) 29/7/48. Fairly common. Capitula of *Cnicus lanceolatus* L.

longicauda Mg. 1838 (*acuticornis* Lw. 1846). **G.** Colesborne (J. Edwards) 17/8/49. **S.** Moorlinch (Cw.) 29/7/48, Walton Hill (Cw.) 23/8/48. Uncommon. Capitula of *Cnicus eriophorus* L.

TRYPETA Mg. 1803 (ORELLIA auctt. *nec* R.D.)

Fulvous flies with black spots on thorax and four rows of black spots on abdomen; in wing, four broad, black bands more or less confluent in the upper part.

S. G. CHAETOSTOMELLA Hend. 1927

Vibrissae present.

cylindrica R.D. 1830 (*onotrophes* Lw. 1844). **G.** Wotton-under-Edge (P.), Selsley (Wt.), Hallen (A.) 24/7/28. **S.** Shepton Mallet (C.), Sharpham (A.) 3/8/23, Walton Moor (F.) 13/6/48, Norton Fitzwarren (F.) 24/7/48. Fairly common. Capitula of *Arctium majus* Bernh. and *Centaurea nigra* L.

S. G. TRYPETA *s.str.*

Vibrissae absent.

falcata Scop. 1763. **G.** Rodborough (Fl.) 9/6/43, Symonds Yat (Fl.) 19/5/42, Filton (F.) 28/6/46. Uncommon. Root stock of *Tragopogon pratense* L.

tussilaginis F. 1775. **G.** Olveston (A.) 30/8/22, Hallen (B.) 23/8/27, Coombe Dingle (F.) 3/7/48. **S.** Sharpham (A.) 3/8/23, Prior Park, Bath (A.) 8/7/25, Clevedon (A.) 30/7/40, Edington (Cw.) 5/8/46, Moorlinch (Cw.) 29/7/48. Common. In seeds of *Arctium majus* Bernh. and capitula of *Cnicus eriophorus* L. N.B. The records of *T. lappae* Cedj. probably were this species.

ruficauda F. 1794 (? *florescentiae* L. 1758). **G.** Filton (F.) 10/7/46. **S.** Weston-s-Mare (J.), Wells (L.), Shapwick (B.) 22/6/24, Clevedon (A.) 23/6/25. Uncommon. Capitula of *Cnicus palustris* Wild. and *C. arvensis* Hoff.

XYPHOSIA R.D. 1830

S. G. ACINIA R.D. 1830

Light-yellow fly with more or less visible, black spots on thorax and abdomen; in wing three dark bands with clear spots in each.

corniculata Zett. 1819. **S.** Brockley Combe (H.), Leigh Woods (H.), Pensford (H.). These records need confirmation. Life-history unknown.

S. G. XYPHOSIA *s.str.*

Like ACINIA, but wing pattern consists of light spots on a dark background.

miliaria Schrk. 1781. **G.** and **S.** Common. In capitula of various Thistles.

PAROXYNA Hend. 1927

There are no records of any species, but they should occur in this district. *P. plantaginis* Hal. 1833 in capitula of *Aster tripolium* L. and *P. tessellata* Lw. 1844 in capitula of *Crepis virens* Vill., *Hypochaeris radicata* L., *Sonchus* spp. and *Leontodon* spp.

OXYNA R.D. 1830

Dark-brown flies with dark wings containing many clear spots. (N.B. In PAROXYNA the body is darker and the clear spots of the wing larger.)

flavipennis Lw. 1844. **G.** Hallen (B.) 11/6/29. **S.** Brockley Combe (A.) 6/21. Uncommon. Galls on rootstock of *Achillea millefolium* L.

proboscidea Lw. 1844 (*nebulosa* auctt. *nec* Wied.). **S.** Wells (L.), Moreton (A.) 20/6/33, Berrow (A.) 27/8/24, Shapwick (A.) 29/6/39, Tickenham (B.) 20/7/42. Uncommon. Rootstock of *Achillea millefolium* L. and *Chrysanthemum leucanthemum* L.

SPHENELLA R.D. 1830

Black fly with yellow scutellum and some yellow bands on abdomen; in wing dark spots below costa and one vertical, dark band.

marginata Fall. 1820. **G.** Wotton-under-Edge (P.), Shirehampton (A.) 30/8/33, Kingsweston (F.) 6/9/36, Durdham Down (F.) 20/9/47, Filton (F.) 28/9/48. **S.** Clevedon (W.) and (A.) 5/7/40 and 16/8/45, Berrow (A.) 18/9/41. Common. Capitula of *Senecio* spp.

ENSINA R.D. 1830

Like SPHENELLA, but wing almost clear.

sonchi L. 1767. **G.** and **S.** Common. In capitula of *Sonchus* spp.

TEPHRITIS Lat. 1804 (URELLIA R.D. 1830 *p.p.*)

Black flies, wings dark with clear spots.

bardanae Schrk. 1803. **G.** and **S.** Fairly common. In capitula of *Arctium majus* Bernh.

conjuncta Lw. 1844 (*separata* Rond. 1862). **G.** Durdham Down (F.) 25/7/46. Rare. Life-history unknown.

cometa Lw. 1844. **G.** Painswick (W.). Rare. Life history unknown.

vespertina Lw. 1844. **G.** and **S.** Common. Capitula of *Hypochaeris radicata* L.

leontodontis Deg. 1776. **G.** Wotton-under-Edge (P.). Rare. Capitula of *Leontodon autumnale* L.

TRUPANEA Schrk. 1796 (*emend.* TRYPANEA Agassiz 1846, URELLIA R.D. 1830)

Small, dark fly; wing bears a black patch with stellate radiations.

amoena Ffld. 1856. **G.** Cirencester (T.). Rare. In capitula of *Lactuca virosa* L. and *Picris hieracioides* L.

HOPLOCHAETA Rond. 1856 (Carphotricha L.N. 1862, Noeeta auctt. *nec* R.D.)

Dark-brown fly with dark spots on thorax and abdomen ; wing has a black patch in centre with stellate radiations to edge of wing ; four scutellar bristles.

pupillata Fall. 1814. **G.** Painswick (W.) 3/6/90. Rare. Capitula of *Hieracium* spp.

DITHRYCA Rond. 1856 (Carphotricha Lw. 1862)

Like Hoplochaeta, but only two scutellar bristles.

guttularis Mg. 1826. **G.** Painswick (W.), Sheepscombe (St.) 29/6/24, Hallen (A.) 1/8/29, Rodborough (Fl.) 14/7/39. **S.** Shapwick (A.) 6/21, Loxley Wood, Shapwick (Cl.) 29/7/48. Uncommon. Galls in stem and rootstock of *Achillea millefolium* L.

Family :—**Lauxaniidae** (Sapromyzidae)

Small, black or yellow flies with clear or slightly spotted wings ; two pairs of fronto-orbital bristles ; preapical bristle present on tibiae ; larvae saprophagous or parasitic on plants.

LAUXANIA Lat. 1804

Shining, black flies ; apical antennal segment long, arista bare.

S. G. CALLIOPUM Strand 1928 (Calliope Hal. 1840 *preoc.*, Halidayella Hend. 1925 *preoc.*)

aeneum Fall. 1820. **G.** and **S.** Common. Larvae parasitic on Clover and Wild Pansy.

simillimum Coll. 1933. **G.** Olveston (A.) 5/9/22, Durdham Down (F.) 24/9/47, Coombe Dingle (F.) 7/6/48. **S.** Tickenham (A.) 24/6/24, Clevedon (A.) 25/9/39, Barrow Gurney (F.) 27/6/48. Not uncommon.

S. G. Lauxania *s.str.*

geniculata F. 1805. **S.** Clevedon (A.) 18/6/40. Rare.

SAPROMYZA Fall. 1810

Usually yellow flies (a few species are matt-black) ; wing clear or slightly spotted ; apical antennal segment short ; arista bare, pubescent or plumose.

S. G. Tricholauxania Hend. 1908

praeusta Fall. 1820. **G.** and **S.** Common. A yellow fly, the only one with the second longitudinal vein setulose ; lower, outer cross-vein darkened.

S. G. Homoneura v.d. Wulp 1891

notata Fall. 1820. **G.** Cirencester (T.) 25/6/23. **S.** Weston-s-Mare (J.), Edington (Cw.) 5/7/47, Street Heath, Sharpham (Cw.) 24/7/48. Palpi yellow ; four rows of acrostichal bristles ; wing with five spots. N.B. The records for *S. biumbrata* Lw. 1847 are probably this species.

S. G. Minettia R.D. 1830

longipennis F. 1794. **G.** and **S.** Common. Matt black fly with plumose arista and extreme base of wing darkened.

fasciata Fall. 1826. **G.** and **S.** Fairly common. Dark-brown fly with black marks on abdomen, wing clear. *S. rivosa* Mg. 1826 resembles this fly and can only be separated on male genital characters.

lupulina F. 1787. **G.** Wotton-under-Edge (P.), Painswick (W.). **S.** Culmhead (H.). Uncommon. Blue-grey thorax with black margin to scutellum, yellow abdomen.

plumicornis Fall. 1820. **G.** Coombe Dingle (F.) 15/6/46, Kingsweston (F.) 17/6/46, Bristol (F.) 30/5/48, Filton (F.) 10/6/48. Uncommon. Yellow fly with clear wing and plumose arista.

S. G. PRORHAPHOCHAETA Cz. 1932

inusta Mg. 1826 (*spectabilis* Lw. 1858). **G.** and **S.** Fairly common. Yellow fly with plumose arista, and, in wing, costal edge, apex and lower, outer cross-vein darkened.

S. G. AULOGASTROMYIA Hend. 1925

anisodactyla Lw. 1845. **G.** Filton (F.) 24/5/49.

S. G. MIIOSIMYZA Hend. 1925

platycephala Lw. 1847 (*difformis* Lw. 1858). **G.** Blaise Castle (F.) 2/7/49. **S.** Portishead (A.) 9/24, Clevedon (A.) 1/6/40. Uncommon. The abdomen bears a pair of warts.

S. G. LYCIELLA Coll. 1948 (LYCIA R.D. 1830 *preoc.*)

All have a strong, presutural dorso-central bristle.

rorida Fall. 1820. **G.** and **S.** Very common. Front-femora with antero-ventral row of tiny spines ; palpi yellow.

pallidiventris Fall. 1820. **G.** and **S.** Common. No spines on front-femora ; palpi brown ; thorax dark.

illota Lw. 1847 (*subfasciata* Zett. 1847). **G.** Bristol (A.) 18/7/26, Kingsweston (F.) 9/6/46. **S.** Leigh Woods (F.) 7/6/49. Like *pallidiventris*, but thorax yellow.

sordida Hal. 1833 (*inculta* Pand. 1902). **G.** Bristol (A.) 15/7/36, Kingsweston (F.) 17/6/46, Filton (F.) 29/8/46, Blaise Castle (F.) 6/10/46, Coombe Dingle (F.) 22/8/48, Durdham Down (F.) 9/7/47. **S.** Clevedon (A.) 31/8/41, Tickenham (A.) 20/6/23. Fairly common. Six rows of acrostichal bristles.

decipiens Lw. 1847 (*sordida* Wlk. *nec* Hal.). **G.** Awkley (A.) 8/9/22, Blaise Castle (A.) 9/21, Winterbourne (A.) 7/7/29, Durdham Down (F.) 31/8/46, Coombe Dingle (F.) 7/9/46 and 24/5/47. **S.** Wells (L.), Pensford (H.), Keynsham (A.) 1/6/29, Shapwick (A.) 22/6/35. Fairly common. Two rows of acrostichal bristles ; wing clear.

affinis Zett. 1847. **S.** Burnham (A.) 6/8/23. Uncommon. Two rows of acrostichal bristles ; wing with dark patch at apex.

decempunctata Fall. 1830. **G.** Bristol (C.) and (A.) 24/8/36, Shepperdine (A.) 12/8/24, Stone (A.) 21/5/27, Morton (F.) 8/7/47. **S.** Shepton Mallet (C.), Leigh Woods (H.), St. Audries (A.) 23/8/29, Clevedon (A.) 31/8/40 and (F.) 12/7/47, Taunton (Cl.) 6/9/48. Fairly common. Four rows of acrostichal bristles ; wing with five dark spots ; palpi yellow with black apex

laeta Zett. 1838. **G.** Coombe Dingle (F.) 6/7/47. **S.** West Town (F.) 1/6/47. Uncommon. Like *S. rorida* Fall., but no spines on front-femora.

S. G. SAPROMYZA *s.str.*

No presutural dorso-central bristle ; no spines on front-femora.

quadripunctata L. 1767. **G.** Coombe Dingle (F.) 2/8/44. **S.** Berrow (A.) 13/7/30 and 26/6/39, Failand (F.) 29/7/45. Uncommon. Two rows of acrostichal bristles and two pairs of black spots on abdomen.

bipunctata Mg. 1830. **S.** Clevedon (A.) 23/7/45. Rare. Four rows of acrostichal bristles and one pair of black spots on abdomen ; preapical bristle present on hind-tibia.

obsoleta Fall. 1820. **G.** Cirencester (T.). **S.** Charterhouse-on-Mendip (A. 30/6/23. Uncommon. Four rows of acrostichal bristles, no spots on abdomen, no preapical bristle on hind-tibia.

apicalis Lw. 1847. **G.** Awkley (A.) 8/9/22. **S.** Clevedon (A.) 23/7/40. Uncommon. Like S. *bipunctata* Mg., but no spots on abdomen.

hyalinata Mg. 1826 (*amica* Hal. 1833). **G.** Coombe Dingle (F.) 12/5/47. **S.** Leigh Woods (H.), Pensford (Ch.) 7/6/25 (recorded as *Lonchaea pusilla* Mg.) Uncommon. A black fly with four rows of acrostichal bristles.

PEPLOMYZA Hal. 1837

Small, yellow flies with four dark stripes on the thorax ; face and frons with black spots ; in wing, a continuous, black band along costa, over apex and lower longitudinal veins.

litura Mg. 1826 (*wiedemanni* Lw. 1845). **G.** Kingsweston (Wm.) 16/6/22 and (F.) 17/6/46, Cirencester (T.) 4/7/23, Durdham Down (F.) 22/8/47, Coombe Dingle (F.) 22/5/48, Blaise Castle (F.) 17/7/48. **S.** Nailsea (C.), Taunton (Pa.), Wells (L.), Leigh Woods (H.) and (A.) 12/10/22, St. Audries (A.) 22/8/29, Clevedon (A.) 9/9/46 and (Bd.) 1/9/47 and (F.) 12/7/47, Cadbury Camp (F.) 12/7/47, Loxley Wood, Shapwick (Cw.) 30/8/48. Fairly common.

TRIGONOMETOPUS Macq. 1835

Head triangular in profile ; no presutural dorso-central bristle ; wing clear with extra cross-veins.

frontalis Mg. 1830. **S.** Edington (Cw.) 13/7/47, Street Heath, Sharpham (F.) 22/5/49. Rare.

Family :—**Tylidae** (Micropezidae)

Medium-sized flies with long, narrow bodies and very long, slender legs ; third and fourth longitudinal veins converge ; flies predatory ; life-history unknown.

TREPIDARIA Mg. 1800 (Calobata Mg. 1803)

Head round, face vertical (normal shape).

S. G. Paracalobata Hend. 1922

ephippium F. 1794. **S.** Edington Moor (Cw.) 31/5/49.

S. G. Compsobata Cz. 1930

cibaria L. 1758. **G.** and **S.** Fairly common. Black fly with yellow legs and dark-brown humeri.

S. G. Trepidaria *s.str.*

petronella L. 1758. **G.** Wotton-under-Edge (P.), Painswick (W.), Selsley (Wt.). Uncommon. Like Compsobata, but humeri orange.

TYLOS Mg. 1800 (Micropeza Mg. 1803)

Head triangular, face narrow and horizontal.

corrigiolatus L. 1767. **G.** Painswick (W.), Bristol (C.), Cirencester (T.) 13/6/24. **S.** Batheaston (Bl.). Uncommon.

Family :—**Psilidae**

Medium-sized flies, black or brown, with long, narrow body, third and fourth longitudinal veins parallel—there is a dip in the fourth longitudinal vein where the cross-vein meets it ; larvae parasitic on plants.

CHYLIZA Fall. 1820

Black flies with perpendicular face, jowls narrow ; antennae short.

S. G. Dasyna R.D. 1830 (Megachetum Rond. 1856)

Apical antennal segment rather long, arista much thickened, bare.

extenuata Rossi 1790 (*atriseta* Mg. 1826). **G.** Sheepscombe (St.) 18/6/27, Coombe Dingle (F.) 7/6/48. **S.** Edington (F.) 19/6/48. Uncommon. Larvae in rootstock of *Orobanche* spp.

S. G. Chyliza *s.str.*

Apical antennal segment short, arista thin, shortly plumose.

annulipes Macq. 1835. **G.** Blaise Castle (F.) 8/5/48, Coombe Dingle (F.) 8/5/49. Rare.

leptogaster Panz. 1798 (*permixta* Rond. 1856, *scutellata* F. 1798). **G.** Selsley (W.), Stone (A.) 21/5/27, Blaise Castle (F.) 17/7/48. **S.** Wells (L.), Tickenham (A.) 7/7/23, Clevedon (A.) 3/6/40, Loxley Wood, Shapwick (Cw.) 21/6/47, Edington (Cw.) 8/6/48. Uncommon.

nova Coll. 1944 (? *obscuripennis* Lw. 1858). **G.** Hallen (A.) 19/6/26, Coombe Dingle (F.) 30/5/48, Blaise Castle (F.) 17/7/48. **S.** Loxley Wood, Shapwick (Cw.) and (F.) 21/6/47.

vittata Mg. 1826. **G.** Dursley (A.) 9/6/25. **S.** Loxley Wood, Shapwick (Cw.) and (F.) 20/6/48. Larvae in rootstock of *Neottia nidusavis* Rich. The only species of which the life-history is known.

LOXOCERA Mg. 1803

Antennae long and apical segment long ; life-history unknown.

S. G. LOXOCERA *s.str.*

aristata Panz. 1801 (? *ichneumonea* L. 1761). **G.** Awkley (A.) 5/9/23, Olveston (A.) 2/9/23. **S.** Batheaston (Bl.), Sharpham (A.) 22/8/22, Tickenham (A.) 16/9/22, Street Heath, Sharpham (Cw.) 11/7/45, Edington (Cw.) 12/6/47. Fairly common.

S. G. IMANTIMYIA Frey 1925

albiseta Schrk. 1803. **G.** and **S.** Common.

PSILA Mg. 1803

Like CHYLIZA, but face retreating, jowls deep ; black and yellowish-brown flies.

S. G. CAMPTOPSILA Frey 1925

lefebvrei Zett. 1835. **G.** Coombe Dingle (F.) 29/5/46. Rare. Hind-femora thickened and curved in the male.

S. G. PELETHOPHILA Hagenb. 1822

fimetaria L. 1758. **G.** and **S.** Common. Apical antennal segment fulvous with dark spot at base of arista.

merdaria Coll. 1944. **G.** and **S.** Equally common. No dark spot at base of arista.

S. G. TETRAPSILA Frey 1925

obscuritarsis Lw. 1866. **G.** Filton (F.) 6/6/47, 23/5 and 10/6/49. Rare. Four scutellar bristles.

S. G. PSILA s.str. (CHAMAEPSILA Hend. 1917)

pallida Fall. 1820. **S.** Wincanton (Verrall) 1889.

bicolor Mg. 1826. **G.** Painswick (W.) 18/5/95.

rosae F. 1794. **G.** and **S.** Common. This is the Carrot Fly, larvae in roots of *Daucus carota* L. and *Brassica napus* L.

nigricornis Mg. 1826. **G.** and **S.** Common. Differs from *P. rosae* F. mainly in the male genitalia.

nigra Fall. 1820. **G.** Painswick (W.) 18/5/95.

atra Mg. 1826. **S.** Shepton Mallet (C.).

rufa Mg. 1826. **G.** Almondsbury (Ba.) 26/5/42.

Family :—**Megamerinidae** (PSILIDAE *p.p.*)

Medium-sized, black fly with long, narrow abdomen and fulvous legs ; hind-femora thickened and spinulose beneath.

MEGAMERINA Rond. 1874 (LISSA Mg. 1826 *preoc.*)

loxocerina Fall. 1820. **S.** Taunton (Pa.), Portbury (A.) 10/6/39, Loxley Wood, Shapwick (F.) 5/7/47. Uncommon.

Family :—**Sepsidae**

Small, black flies with globular head ; wing iridescent, clear except for a black spot at apex in one genus ; fore-femora, and sometimes fore-tibiae, of male modified in shape and spinulose ; flies found on low vegetation, sometimes in swarms ; larvae saprophagous.

SALTELLA R.D. 1830 (PANDORA Hal. 1833 *preoc.*)

Scutellum with four bristles ; vibrissae present ; wing clear, upper basal cell absent ; abdomen not petiolate.

scutellaris Fall. 1820 (*sphondylii* Schrk. 1803). **S.** Langport (Dl.). Rare.

basalis Hal. 1833 (? *nigripes* R.D. 1830). **S.** Tickenham (A.) 19/7/24. Rare.

ENICITA Westw. 1840 (*emend.* HENICITA Agassiz 1846)

Scutellum with two bristles ; vibrissae absent ; wing clear and upper basal cell present in this and all the other genera ; tarsi of mid-leg dilated in male ; bunch of hairs on male genitalia.

annulipes Mg. 1826. **G.** Awkley (A.) 8/9/22, Hallen (A.) 11/9/28. **S.** Leigh Woods (H.), Sharpham (A.) 10/8/23, Bleadon (A.) 20/9/41. Uncommon.

THEMIRA R.D. 1830

Like ENICITA, but tarsi of mid-leg not dilated in male.

minor Hal. 1833. **G.** Durdham Down (F.) 15/9/46, Blaise Castle (F.) 25/4/48, Filton (F.) 3/5/48. **S.** Coxley, Wells (F.) 1/6/46. Uncommon.

leachi Mg. 1826. **S.** Shepton Mallet (C.), Sharpham (A.) 18/8/25, Edington (Cw.) 15/5/47. Not uncommon.

putris L. 1758. **G.** and **S.** Common near manure heaps.

superba Hal. 1833. **G.** Filton (F.) 22/5/47. **S.** Nailsea (A.) 28/6/39. Uncommon.

lucida Staeg. 1844. **S.** Tickenham (A.) 16/6/40. Rare.

MEROPLIUS Rond. 1874

Abdomen petiolate (constricted at base) in this and the following genera ; wing clear ; fore-femora with two spines in the male.

stercorarius R.D. 1830. **G.** and **S.** Very common.

NEMOPODA R.D. 1830

Like MEROPLIUS, but no orbital bristles and more than two spines on fore-femora in the male.

nitidula Fall. 1820 (*cylindrica* F. 1794 *preoc.*). **G.** and **S.** Very common.

SEPSIS Fall. 1810

Wing with dark, circular spot at apex ; no orbital bristles.

fulgens Mg. 1826 (*cynipsea* auctt. *nec* L.). **G.** and **S.** Very common.

punctum F. 1794. **G.** Wotton-under-Edge (P.), Olveston (C.) 5/17, Shepperdine (A.) 5/8/24. **S.** Leigh Woods (H.), Shapwick (J.) and (Cw.) 25/5/48. Uncommon.

violacea Mg. 1826. **G.** and **S.** Fairly common.

flavimana Mg. 1826. **G.** Shepperdine (A.) 2/8/24. **S.** Kenn Moor (A.) 16/6/39, Edington (Cw.) 16/5/47. Uncommon.

orthocnemis Frey 1908. **S.** Clevedon (A.) 12/6/47. Rare.

cynipsea L. 1758 (*incisa* Strobl 1909). **S.** St. Audries (A.) 29/2/29, Shepton Mallet (A.) 5/9/44, Clevedon (A.) 4/6/40. Fairly common.

Family :—**Tetanoceridae** (SCIOMYZIDAE)

Medium-sized to rather large flies ; vibrissae absent ; post ocellar (vertical) bristles divergent ; preapical bristle on hind-tibiae ; larvae saprophagous, possibly carnivorous ; flies found mainly in damp situations.

PHAEOMYIA Schin. 1862

More than one preapical bristle on mid- and hind-tibia; dark fly with dark wings; antennae short.

fuscipennis Mg. 1830. **G.** Coombe Dingle (F.) 8/6/47. **S.** Leigh Woods (H.), Shepton Mallet (C.), Clevedon (B.) 25/6/39, Holford (Cw.) 12/6/48. Uncommon.

SCIOMYZA Fall. 1820

Only one preapical bristle on mid- and hind-tibia, brownish-yellow flies with clear wings; antennae short.

albocostata Fall. 1820. **G.** and **S.** Fairly common.

griseola Fall. 1820. **S.** Wells (L.), Leigh Woods (H.), Sharpham (A.) 8/8/23. Uncommon.

austera Mg. 1830 (*lata* Schin. 1862). **S.** Shapwick (A.) 1/5/27. Rare.

annulipes Zett. 1846. **S.** Clevedon (A.) 18/6/40. Rare.

nana Fall. 1820. **G.** Blaise Castle (F.) 2/7/49. **S.** West Town (F.) 28/6/47. Rare.

dubia Fall. 1820. **G.** Cirencester (T.), Blaise Castle (A.) 22/5/27. **S.** Wells (L.), Brockley Combe (H.), Prior Park, Bath (A.) 20/5/29, Backwell (A.) 6/6/25, Clevedon (A.) 3/6/40, Oakhill (Cw.) 29/6/47. Not uncommon.

ventralis Fall. 1820. **G.** Filton (F.) 12/4/46, Coombe Dingle (F.) 29/2/48, Blaise Castle (F.) 21/3/48. **S.** Wells (L.), Leigh Woods (A.) 19/3/27, Berrow (B.) 27/7/30, Goblin Combe (F.) 28/9/46. Fairly common.

obtusa Fall. 1820. **S.** Street Heath, Sharpham (Cw.) 24/7/48. Rare.

pallidiventris Fall. 1820. **G.** Coombe Dingle (F.) 30/5/48. **S.** Leigh Woods (H.). Uncommon.

sordida Hend. 1902. **S.** Sharpham (F.) 22/5/49.

scutellaris v.Ros. 1840. **G.** Durdham Down (F.) 15/9/46. Rare.

BISCHOFIA Hend. 1902

Two preapical bristles on fore-tibiae; dark-brown flies with clear wings; antennae short.

simplex Fall. 1820. **S.** Sharpham (A.) 5/9/25, Berrow (B.) 27/7/30. Uncommon.

PTEROMICRA Lioy 1864 (DICROCHIRA Hend. 1902)

Tibiae with only one preapical bristle; small, shining, black flies; wings clear; legs fulvous, antennae short, fulvous.

glabricula Fall. 1820. **G.** Coombe Dingle (F.) 20/5/47. **S.** Sharpham (F.) 6/9/47. Uncommon.

DITAENIA Hend. 1902

Tibiae with only one preapical bristle; dark-brown flies; wing clear with darkened cross-veins; antennae short; ocellar triangle prolonged down centre of frons; costa spinulose.

cinerella Fall. 1820. **G.** and **S.** Common.

PHERBELLIA R.D. 1830

Like DITAENIA, but wing spotted.

schoenherri Fall. 1826. **G.** Dursley (A.) 11/10/30, Coombe Dingle (F.) 26/6/47 and 5/7/48. **S.** Wells (L.), Weston-s-Mare (J.), Nailsea (A.) 22/4/27, Shapwick (A.) 1/5/27, Sharpham (A.) 1/9/25, Edington (Cw.) 9/10/48, Catcott (Cw.) 24/8/47. Not uncommon.

RENOCERA Hend. 1900

Light-brown fly; wing clear with cross-veins somewhat darkened; apical antennal segment three times as long as previous segment.

pallida Fall. 1820. **G.** Littledean (A.) 25/5/31. **S.** Portbury (H.), Sharpham (A.) 22/8/22, Moreton (A.) 19/5/33, Limpley Stoke (A.) 19/5/34, Walton Moor (F.) 23/8/47, Loxley Wood, Shapwick (Cw.) 31/5/47. Not uncommon.

strobli Hend. 1900. **G.** Blaise Castle (F.) 25/8/44, Coombe Dingle (F.) 19/7/48. **S.** Ham Green (F.) 28/6/46. Uncommon.

HEMILOPTERYX Cress. 1920 (HETEROPTERYX Hend. 1902 *preoc.*)

Two preapical bristles on hind-tibiae ; no presutural dorso-central bristles ; dark-brown and black fly ; wing brown and very short.

brevipennis Zett. 1846. **S.** Shapwick (B.) 17/8/27. Rare.

TETANOCERA Dum. 1806

Antennae long, apical segment not much longer than the previous segment, arista plumose ; moderately large, brown flies with dark stripes on the thorax ; wing clear, with costal edge and often cross-veins darkened ; male genitalia large and distinctive.

nigricosta Rond. 1868. **G.** Coombe Dingle (F.) 30/7/44. **S.** Clevedon (A.) 16/5/41. Rare.

hyalipennis v.Ros. 1840 (*laevifrons* Lw. 1847). **G.** Olveston (A.) 28/6/25, Shepperdine (A.) 25/7/24, Blaise Castle (F.) 25/8/44, Coombe Dingle (F.) 19/7/47. **S.** Tickenham (A.) 16/9/22, St. Audries (A.) 20/8/29, Chewstoke (A.) 8/7/42, Ham Green (F.) 23/6/46, Norton Fitzwarren (Cl.) 5/8/48, Loxley Wood, Shapwick (Cw.) 9/8/47. Fairly common.

silvatica Mg. 1830. **G.** Wotton-under-Edge (P.), Selsley (Wt.), Sheepscombe (St.) 21/6/25. **S.** Weston-super-Mare (J.), Catcott (Cw.) 24/5/47, Walton Moor (F.) 29/5/49. Uncommon.

unicolor Lw. 1847. **S.** Edington (Cw.) 13/6/47. Rare.

elata F. 1741. **G.** and **S.** Common.

ferruginea Fall. 1820. **G.** and **S.** Fairly common.

marginella R.D. 1830 (*robusta* Lw. 1847). **G.** and **S.** Common.

arrogans Mg. 1830. **G.** Coombe Dingle (F.) 26/6/49. **S.** Clevedon (W.), Kenn Moor (A.) 27/6/39, Shapwick (A.) 29/6/39 and (Cw.) 14/5/48, Street Heath, Sharpham (Cw.) 11/6/47, Edington (Cw.) 13/6/47. Fairly common.

N.B. The last three species are much alike, differing in male genitalia.

TRYPETOPERA Hend. 1900

Apical antennal segment pointed, arista plumose ; wing dark with many clear spots ; yellowish-brown fly with black markings on abdomen.

punctulata Scop. 1763. **G.** and **S.** Fairly common.

PHERBINA R.D. 1830

Like TRYPETOPTERA, but larger and wings clear with many dark spots on the veins.

communis R.D. 1830 (*punctata* F. 1794 *preoc.*). **G.** Painswick (St.) 29/6/24, Cleve Hill (St.) 29/6/24. **S.** Taunton (Pa.), Clevedon (W.), Leigh Woods (H.). Uncommon.

coryleti Scop. 1763. **G.** Wotton-under-Edge (P.), Olveston (A.) 18/6/22. **S.** Shepton Mallet (C.), Shapwick (A.) 3/9/22, Berrow (B.) 14/7/26, Clevedon (A.) 16/9/41, Walton Moor (F.) 18/6/48, Edington (Cw.) 13/6/47 and 22/5/48, Street Heath, Sharpham (Cw.) 11/6/47. Not uncommon.

ELGIVA Mg. 1838 (HEDRONEURA Hend. 1902)

Apical antennal segment pointed, arista bare ; wings clear with two or three black spots on the cross-veins, the lower, outer cross-vein sinuous ; fairly large, light-brown flies ; no presutural acrostichal bristles.

sundewalli Fries 1823 (*rufa* Panz. 1798 *preoc.*). **G.** and **S.** Fairly common.

cucularia L. 1767. **G.** and **S.** Fairly common.

ILIONE Hal. 1840 (CHIONE R.D. 1830 *preoc.*)

Like ELGIVA, but presutural acrostichal bristles present.

albiseta Scop. 1763. **G.** and **S.** Common.

lineata Fall. 1820. **G.** Shepperdine (F.) 26/9/48. **S.** Shapwick (A.) 3/9/22, Brockley Combe (F.) 27/6/36, Edington (Cw.) 13/6/47 and 12/10/48. Uncommon.

HYDROMYA R.D. 1830 (*emend.* HYDROMYIA Agassiz 1846)

Like ELGIVA, but wing has just four black spots along the fourth longitudinal vein ; smaller, darker fly.

dorsalis F. 1794. **G.** Shepperdine (A.) 4/8/24, Bristol (A.) 29/6/33, Damery (F.) 23/3/36, Filton (F.) 1/7/47, Coombe Dingle (F.) 7/3/48, Blaise Castle (F.) 22/8/48. **S.** Tickenham (Wm.) 23/7/22, Edington (Cw.) 20/5/47. Not uncommon.

LIMNIA R.D. 1830

Arista pubescent ; wing with a network of dark lines and lower, outer cross-vein almost straight ; mesopleuron and sternopleuron hairy.

unguicornis Scop. 1763. **G.** and **S.** Common.

EUTHYCERA Lat. 1809

Like LIMNIA, but mesopleuron and sternopleuron bare.

fumigata Scop. 1763 (*rufifrons* F. 1781). **G.** and **S.** Common.

fenestrata Macq. 1835. **G.** Coombe Dingle (F.) 16/6/45, Filton (F.) 11/9/46. **S.** Kewstoke (C.) 7/18, Chewstoke (A.) 8/7/32. Uncommon.

STATINIA Mg. 1800 (COREMACERA Rond. 1856)

Apical antennal segment with a brush of hairs at apex, arista long and white-pubescent ; wing dark with very dark costal border and many small, clear spots ; black fly.

marginata F. 1775. **G.** Cirencester (T.) 9/7/24, Aust (C.) 7/18, Durdham Down (F.) 2/6/46, Filton (F.) 24/6/48. **S.** Weston-s-Mare (H.), Brean Down (B.) 25/8/24, Berrow (A.) 18/9/41, Clevedon (A.) 19/7/42. Uncommon.

SEPEDON Lat. 1804

Antenna very long, especially the second segment, arista bare ; hind-femora swollen and spinulose ; wing clear, slightly darkened on cross-veins ; fairly large, shining, black or brown flies ; larvae live in *Lemna* spp. and *Iris pseudacorus* L.

sphaegeus F. 1775. **G.** and **S.** Fairly common.

spinipes Scop. 1763. **G.** and **S.** Common.

DICHAETOPHORA Rond. 1868

Like SEPEDON, but antennae of normal length and upper half of wing with a network of dark lines ; brown fly.

obliterata F. 1805. **G.** and **S.** Fairly common.

SALTICELLA R.D. 1830

The lower basal cell of the wing is closed by a slanting cross-vein instead of the usual vertical one, the third and fourth longitudinal veins converge, there are two dark spots on the upper cross-veins ; hind-femora much swollen and spinulose above ; fly rust-coloured with black spots on thorax ; larvae parasitic on *Helix pisana* Müll.

fasciata Mg. 1830. **G.** Coombe Dingle (F.) 8/6/47. **S.** Weston-s-Mare (L.). Rare.

TETANURA Fall. 1820

Apical antennal segment round, arista apical ; small, shining, black fly with slightly clouded wings.

pallidiventris Fall. 1820. **G.** Coombe Dingle (F.) 19/6/47 and 28/5/49. **S.** Loxley Wood, Shapwick (Cw.) 31/5/47, Holford (Cw.) 12/6/48. Rare.

Family :—**Chamaemyiidae** (Ochtiphilidae)

Very small, dark flies ; wing clear, first longitudinal vein sinuously curved upwards towards the subcostal vein ; no preapical bristles on tibiae ; some larvae are inquilines in plant galls, some feed on Aphids and Coccids ; flies live in low vegetation.

CHAMAEMYIA Mg. 1803 (Ochtiphila Fall. 1823)

flavipalpis Hal. 1838 (*maritima* Zett. 1846). **S.** Berrow (B.) 23/6/26. Rare, on Marram Grass.

juncorum Fall. 1823 (*polystigma* Mg. 1830). **G.** Olveston (A.) 30/7/22. **S.** Sharpham (A.) 22/8/22, Berrow (A.) 18/9/41. Rare, larvae inquilines in galls of *Lipara* on *Phragmites communis* Trin. and in galls of *Lonchaea* on *Agropyrum repens* Pal. ; also found among *Phalaris arundinacea* L. where they feed on *Pseudococcus phalaridis* Green.

herbarum R.D. 1830 (*juncorum* auctt. *nec* Fall.). **G.** Bristol (Wm.) 18/7/23. **S.** Berrow (B.) 23/6/26. Rare.

aridella Fall. 1823. **G.** Filton (F.) 30/6/48.

LEUCOPIS Mg. 1830

obscura Hal. 1833. **S.** Walton Moor (F.) 7/5/49.

Family :—**Coelopidae** (Phycodromidae)

Medium-sized, brown, flat, horny flies ; wings clear and normal ; legs often hairy and spinulose, preapical bristle present on tibiae ; larvae live in decomposing marine Algae.

ORYGMA Mg. 1830

Size of House-fly, apical antennal segment longer than the previous one ; postvertical bristles divergent, legs normal with several preapical bristles on each tibia.

luctuosa Mg. 1830. **G.** and **S.** Common.

MALACOMYIA Hal. 1840 (Phycodroma Stenh. 1853)

Like Orygma, but smaller, and postvertical bristles convergent ; abdomen lighter in colour than the thorax.

sciomyzina Hal. 1833. **G.** Aust (A.) 6/9/23 and 28/8/33. **S.** Berrow (A.) 28/6/25. Not uncommon.

COELOPA Mg. 1830

Medium-sized fly ; apical antennal segment not longer than the previous segment ; post-vertical bristles convergent.

S. G. Coelopa *s.str.*

Jowls and legs hairy.

pilipes Hal. 1839 (*frigida* Mg. 1830 *preoc.*). **S.** Brean Down (A.) 27/8/24 and (Cw.) 27/8/49. Uncommon.

S. G. Fucomyia Hal. 1838

Jowls spinulose ; legs either only spinulose (*frigida*) or spinulose and hairy (*eximia*).

eximia Stenh. 1855 (*frigida* var. *gravis* Hal. 1833). **G.** Aust (A.) 28/8/33. **S.** Clevedon (F.) 12/7/47. Fairly common.

frigida F. 1805 (*simplex* Hal. 1833). **S.** Clevedon (A.) 15/3/41 and (F.) 12/7/47, Portishead (F.) 24/5/47. Fairly common.

Family :—**Helomyzidae**

Yellowish-brown flies of medium size ; the costa of the wing bears a series of long spines besides the usual ciliation ; vibrissae present ; larvae saprophagous, coprophagous or mycetophagous ; flies found in damp, dark places.

HELOMYZA Fall. 1820 (SUILLIA R.D. 1830)

Occipital plates (bands usually bordering the eyes) turned inwards away from edge of eye ; in wing, the anal vein does not reach the edge ; humeral and prosternal (between front-coxae) bristles absent.

variegata Lw. 1862. **G.** and **S.** Fairly common ; larvae in roots of *Aster tripolium* L.

notata Mg. 1830 var. *hilaris* Zett. 1847 (*pectoralis* Lw. 1862). **G.** Dursley (A.) 20/6/25 **S.** Failand (F.) 14/10/49. Uncommon.

inornata Lw. 1862. **S.** Nailsea (C.), Culmhead (H.), Wells (L.). Uncommon.

affinis Mg. 1830. **G.** Painswick (W.), Wotton-under-Edge (P.), Dursley (A.) 1/5/30, Durdham Down (F.) 28/8/46, Coombe Dingle (F.) 10/6/47. **S.** Wells (L.), Nailsea (Wm.) 11/6/27, Clevedon (A.) 26/6/40 and 24/6/44, Loxley Wood, Shapwick (Cw.) 18/6/48, East Harptree (Cw.) 25/6/47. Fairly common.

umbratica Mg. 1838. **S.** Clevedon (A.) 14/5/40. Rare.

flava Mg. 1830. **G.** Olveston (A.) 8/10/22, Kingsweston (F.) 9/6/45. Larvae in *Agaricus arvensis* L.

similis Mg. 1838. **S.** Wells (L.), Clevedon (A.) 11/7/47.

laevifrons Lw. 1862. **S.** Sharpham (A.) 31/7/25 and 5/9/25.

pallida Fall. 1820. **G.** Ruscombe (W.), Coombe Dingle (F.) 26/7/47, Durdham Down (F.) 24/9/47, Blaise Castle (F.) 18/10/47. **S.** Wells (L.), Leigh Woods (H.), Sharpham (A.) 8/8/25, Clevedon (A.) 25/6/29, 19/10/40 and 9/5/48. Fairly common, larvae said to live in *Tuber melanosporum* Vitt.

ustulata Mg. 1830. **G.** Ruscombe (W.), Blaise Castle (A.) 4/3/22 and (F.) 14/3/48, Durdham Down (F.) 26/8/46, Coombe Dingle (F.) 29/2/48. **S.** Holford (A.) 2/21, Leigh Woods (A.) 19/3/37, Clevedon (A.) 13/6/41, Edington (Cw.) 29/2/48. Fairly common ; has been bred from *Tuber melanosporum* Vitt. but here must feed on other fungi.

bicolor Zett. 1838 (*zetterstedti* Lw. 1862). **S.** Leigh Woods (A.) 18/10/24, Clevedon (A.) 7/9/41 and 15/10/47, Loxley Wood, Shapwick (Cw.) 31/5/47 and 24/9/48. Fairly common ; has been bred from *Amanita citrina* Sch., *Boletus* spp., *Lactarius deliciosus* L., *Pholiota squarrosa* Müll, *Russula cyanoxantha* Sch. (Fr.) and *Armillaria mellea* Vshl. (Fr.).

fuscicornis Zett. 1847 (*montana* Lw. 1862). **G.** Hallen (A.) 10/10/25, Blaise Castle (F.) 5/10/47, Coombe Dingle (F.) 28/7/47. **S.** Leigh Woods (A.) 12/10/22 and 18/10/24. Fairly common ; has been bred from *Clitocybe geotropa* Bull. (Fr.) var. *maxima* (Fr.) Nüesch., *Amanita citrina* Sch. and *Boletus edulis* (Bull.) Fr.

dumicola Coll. 1943. **G.** Coombe Dingle (F.) 28/7/47. **S.** Leigh Woods (F.) 11/6/49.

ALLOPHYLA Lw. 1862

Like HELOMYZA, but humeral bristle present.

atricornis Mg. 1830. **G.** Coombe Dingle (F.) 15/6/47, Blaise Castle (F.) 14/10/47. **S.** Leigh Woods (H.) and (A.) 12/10/22 and 10/9/34, Loxley Wood, Shapwick (Cw.) 4/11/46 and 24/9/48, Failand (F.) 14/10/49.

THELIDA R.D. 1830

Occipital plates touching edge of eye ; in wing, anal vein reaching the edge ; prosternal bristles absent, mid-tibia with one spur ; presutural dorso-central bristles present ; first longitudinal vein reaching the costa far beyond the level of the middle cross-vein.

rotundicornis Zett. 1846 (*atricornis* auctt. *nec* Mg.). **G.** Durdham Down (F.) 17/7/47, Blaise Castle (A.) 6/6/20 and (F.) 3/7/48. **S.** Clevedon (A.) 6/6/40, 21/10/40 and 13/2/41, Edington (Cw.) 18/5/47 and 12/12/48.

commixta Coll. 1901. **G.** Filton (F.) 9/1/47. **S.** Wells (L.), Shepton Mallet (C.) 31/3/09, Edington (Cw.) 27/11/48, Shapwick (F.) 24/3/46.

HETEROMYZA Fall. 1820

Like THELIDA, but no presutural dorso-central bristles.

oculata Fall. 1820. **G.** Blaise Castle (F.) 5/10/47 and 14/3/48, Coombe Dingle (F.) 4/6/49. **S.** St. Audries (A.) 24/8/29. Uncommon.

TEPHROCHLAMYS Lw. 1862

Like HETEROMYZA, but first longitudinal vein reaching the costa on a level with the middle cross-vein.

tarsalis Zett. 1838. **G.** Brentry (F.) 6/10/47, Filton (F.) 22/4/49, Bristol (F.) 6/11/49. Rare.

flavipes Zett. 1838. **G.** Painswick (W.), Bristol (A.) 3/11/31, Westbury-on-Trym (F.) 14/10/44. **S.** Clevedon (A.) 18/10/40. Uncommon.

canescens Mg. 1830 (*rufiventris* Mg. 1830). **G.** and **S.** Common, often found in caves and dwellings.

laeta Mg. 1830. **G.** Bristol (A.) 20/11/26. Rare.

TEPHROCLAENA Cz. 1924

Like TEPHROCHZAMYS, but presutural dorso-central bristles present; a much smaller fly.

oraria Coll. 1943 (*halterata* Cz. *nec* Mg.). **G.** Filton (F.) 12/3/48. Rare.

NEOLARIA Mall. 1919

Mid-tibiae with several spurs; orbital bristles all the same length.

maritima Villen. 1921 (*flavicornis* auctt. *nec* Lw.). **S.** Nailsea (C.), Wells (L.), Brean (F.) 8/10/49. Uncommon.

ruficeps Zett. 1838. **G.** Filton (F.) 26/3/46. **S.** Leigh Woods (F.) 13/5/50. Rare.

ruficauda Zett. 1847. **G.** Blaise Castle (F.) 22/3/48. Rare.

inscripta Mg. 1830. **S.** West Town (F.) 17/4/47. Rare.

OECOTHEA Hal. 1838

Like NEOLERIA, but only one orbital bristle; eyes unusually small.

fenestralis Fall. 1820. **G.** Morton (S. Green) 10/2/48, Thornbury (S. Green) 6/7/49. **S.** Edington (Cw.) 15/4/49.

MORPHOLERIA Garr. 1921 (SPANOPAREA Cz. 1924)

Like NEOLARIA, but mid-tibiae with only one spur.

kerteszi Cz. 1924. **S.** Clevedon (B.) 9/4/44. Rare.

ruficornis Mg. 1830. **G.** Dursley (A.) 12/10/30. Rare.

CHAETOMUS Cz. 1924

Humeral and one pair of prosternal bristles present.

confusus Wahl. 1918. **G.** Coombe Dingle (F.) 15/6/47. Rare.

SCOLIOCENTRA Lw. 1862

Like CHAETOMUS, but hairy species; pteropleuron hairy.

villosa Mg. 1830. **S.** Clevedon (A.) 25/3/42. Rare.

AMOEBALERIA Garr. 1921

Like SCOLIOCENTRA, but pteropleuron bare.

caesia Mg. 1830. **S.** Banwell (A.) 20/10/28 (in cave); Leigh Woods (A.) 17/10/24.

var. *spectabilis* Beck. 1905. **G.** Cirencester (T.) 16/6/23. **S.** Abbots Leigh (A.) 16/5/26, Goatchurch Cave, Mendip (Wm.) 26/3/27. Not uncommon.

LERIA R.D. 1830 (BLEPHARIPTERA Macq. 1835, HELOMYZA Fall. 1820 *apud* coq. 1920)

More than one pair of prosternal bristles, pteropleuron and scutellum bare.

serrata L. 1758. **G.** Cheltenham (Wm.) 4/4/20, Bristol (A.) 10/10/24, Dursley (A.) 30/3/30. **S.** Shapwick (A.) 3/21, Leigh Woods (A.) 19/3/37, Clevedon (A.) 15/3/41, Burrington Combe (Cw.) 19/12/47, Edington (Cw.) 19/5/47. Not uncommon.

dupliciseta Strobl 1894. **G.** Coombe Dingle (F.) 16/4/50.

modesta Mg. 1838 var. *czernyi* Collart 1933. **G.** Filton (F.) 17/3/47. Rare.

TRIXOSCELIS Rond. 1856 (TRICHOSCELIS Cz. 1927, GEOMYZA Lw. *nec* Fall.)

Very small, greyish flies; in wing, anal vein does not reach the edge; preapical bristles present on tibiae.

obscurella Fall. 1823. **G.** Hallen (A.) 24/7/28. **S.** Kewstoke (H.), Shapwick (A.) 3/9/22, Berrow (A.) 28/6/25 and 26/6/39. Not uncommon.

Family :—**Chyromyidae**

CHYROMYA R.D. 1830 (*emend.* CHIROMYIA Agassiz 1846)

Like TRIXOSCELIS, but costal spines very short, no preapical bristles on tibiae; small, yellow flies found in caves and dwellings; life-history unknown.

flava L. 1758. **G.** Cirencester (T.), Shepperdine (A.) 4/8/24, Hallen (B.) 9/7/26, Cleve Hill (St.) 29/9/24, Bristol (A.) 28/6/35. **S.** West Town (Wm.) 21/7/28, Clevedon (A.) 8/8/42, Edington (F.) 20/6/48. Not uncommon.

oppidana Scop. 1763 (*lutea* Fall. 1820). **G.** Hallen (B.) 9/7/26.

Family :—**Clusiidae** (HETERONEURIDAE)

Small, dark flies captured by sweeping low vegetation in woods.

S. F. CLUSIINAE

The two cross-veins are close together in basal part of wing, some dark patches on the longitudinal veins; tibiae with a preapical bristle; second antennal segment slightly overlapping the apical segment, arista pubescent; larvae in rotten wood.

ACARTOPHTHALMUS Cz. 1902

Eyes hairy, orbital bristles reclinate.

bicolor Oldenb. 1910. **G.** Durdham Down (F.) 30/5/47 and 11/6/47. Rare.

CLUSIODES Coq. 1904 (HETERONEURA Fall. 1823 *preoc.*)

Eyes bare, orbital bristles reclinate.

S. G. CLUSIODES *s.str.*

Presutural dorso-central bristles present.

albimana Mg. 1830. **G.** Olveston (A.) 28/4/23, Coombe Dingle (F.) 21/9/46 and 6/10/46. **S.** Abbots Leigh (A.) 16/5/26, Shepton Mallet (A.) 7/7/42, Taunton (A.) 6/6/31, Edington (Cw.) 2/6/48, Loxley Wood, Shapwick (Cw.) 24/9/48. Not uncommon.

gentilis Coll. 1912. **G.** Coombe Dingle (F.) 29/9/46.

S. G. CLUSIARIA Mall. 1922

Presutural dorso-central bristles absent.

geomyzina Fall. 1823. **S.** Brockley Combe (Wm.) 28/5/27. Rare.

HETEROMERINGIA Mall. 1922

Orbital bristles proclinate or convergent, no crossed frontal bristles.

nigrimana Lw. 1864. **G.** Olveston (A.) 26/4/23. Rare.

CLUSIA Hal. 1838 (STOMPHASTICA Lw. 1864)

Like HETEROMERINGIA, but crossed frontal bristles present.

flava Mg. 1834. **G.** Painswick (W.), Olveston (A.) 25/4/23. Rare.

Family :—**Anthomyzidae**

Very small, dark flies captured by sweeping Reeds and Rushes; larvae are saprophagous or phytophagous.

ANTHOMYZA Fall. 1810

Like Clusiaria, but costa long, ciliated, and no preapical bristles on tibiae.
sordidella Zett. 1848. **S.** Newton St. Loe (Ch.) 9/6/25. Rare.

Family :—**Opomyzidae**

Small, yellow flies with more or less spotted wings ; one orbital, one sternopleural and one humeral bristle; presutural dorso-central bristles present ; larvae parasitic on Gramineae.

OPOMYZA Fall. 1820

Scutellum hairy ; arista pubescent or shortly plumose ; no vibrissae ; an extra, incomplete cross-vein on fourth longitudinal vein beyond the lower cross-vein ; dark band under costa in *germinationis* and *petrei* ; cross-veins darkened in all species.

germinationis L. 1758. **G.** and **S.** Very common.

petrei Mesnil 1934. **G.** and **S.** Very common ; like the above, but abdomen darker.

florum F. 1794. **G.** Cirencester (T.) 7/23, Filton (F.) 25/8/48, Coombe Dingle (F.) 9/10/48. **S.** Loxley Wood, Shapwick (F.) 28/8/48, Edington (Cw.) 27/10/46 and 12/10/48. Fairly common.

GEOMYZA Fall. 1810 (Ballioptera Lw. 1864)

Scutellum bare ; arista plumose on upper side ; vibrissae present ; wing with two or three large, black spots.

breviseta Cz. 1928. **S.** Clevedon (A.) 19/7/42. On *Bromus* spp.

combinata L. 1767. **G.** Painswick (W.), Kingsweston (A.) 9/6/23 and (F.) 17/6/46, Durdham Down (F.) 17/7/47, Filton (F.) 30/6/48. **S.** Kewstoke (C.), Taunton (P.), Wells (L.), Clevedon (A.) 1/9/40, Tickenham (A.) 22/7/22, Berrow (A.) 18/9/41, Sharpham (F.) 6/9/47, Holford (Cw.) 11/9/47. Fairly common, on *Holcus* spp. and *Triticum* spp.

tripunctata Fall. 1823. **G.** Olveston (A.) 5/9/22, Bristol (A.) 6/12/24, Morton (F.) 17/1/46, Durdham Down (F.) 17/7/47, Coombe Dingle (F.) 26/7/47, Filton (F.) 13/4/48. **S.** Edington (Cw.) 30/6/47. Fairly common. On *Triticum* spp.

Family :—**Tethinidae**

Very small, grey or fulvous flies inhabiting coastal districts ; wing clear, anal vein absent, subcostal vein short, not reaching costa; arista bare ; life history unknown. No local records.

Family :—**Ephydridae**

Small, dark-grey to black flies found near water ; no lower basal cell in wing, i.e. only one cross-vein on the fifth longitudinal vein ; no preapical bristles on tibiae, but a spur on the mid-tibia ; larvae terrestial or aquatic when they are carnivorous, or parasitic on plants ; some of the flies are predaceous.

S. F. Notiphilinae

Second antennal segment with a strong dorsal bristle.

DICHAETA Mg. 1830

Costa reaching only to apex of second longitudinal vein ; two orbital bristles ; arista pectinated on upper side ; in male, long hairs at apex of abdomen ; wing clear.

caudata Fall. 1813. **S.** Sharpham (F.) 6/9/47. Uncommon.

NOTIPHILA Fall. 1810

Like Dichaeta, but only one orbital bristle and no hairs at apex of abdomen in male.

uliginosa Hal. 1839. **S.** Berrow (A.) 13/7/30, Street Heath, Sharpham (F.) 23/4/49.

nigricornis Stenh. 1844. **S.** Clevedon (F.) 27/5/47.

riparia Mg. 1830. **G.** Shepperdine (A.) 30/7/24, Filton (F.) 1/7/47. **S.** Shapwick (A.) 17/7/22, Cadbury Camp (Wm.) 23/7/22, Tickenham (A.) 19/7/24, Kenn Moor (A.) 27/6/39, Clevedon (F.) 29/8/48.

cinerea Fall. 1813. **G.** and **S.** Common.

guttiventris Stenh. 1844. **G.** Bitton (C.), Bristol (C.), Stoke Bishop (Ct.) 6/32. **S.** Keynsham (C.).

dorsata Stenh. 1844. **S.** Clevedon (F.) 27/5/47.

annulipes Stenh. 1844. **S.** Berrow (A.) 26/6/39, Street Heath, Sharpham (F.) 22/5/49.

MOSILLUS Lat. 1804

Small, shining, black fly; costa in this and in all other genera reaching the apex of the third longitudinal vein; arista pubescent; no orbital and no dorso-central bristles; wing clear.

subsultans F. 1794. **G.** Olveston (A.) 2/9/23. **S.** Clevedon (W.), Tickenham (Wm.) 8/8/22. Uncommon.

DISCOMYZA Mg. 1830

Small, shining, black fly; base and costal region of wing darkened; abdomen almost circular; arista pectinated on upper side; orbital and dorso-central bristles present.

incurva Fall. 1823. **G.** Durdham Down (F.) 24/9/47. **S.** Tickenham (B.) 7/9/41. Uncommon.

ILYTHEA Hal. 1839

Very small, brown-black fly; wing with rows of dark spots; a row of bristles on the face; jowls cut off horizontally; eyes bare; mouth-opening large; no costal bristle.

spilota Curt. 1832. **S.** Shepton Mallet (C.) 9/5/09.

PSILOPA Fall. 1823 (EPHYGROBIA Schin. 1862)

Very small, shining, black flies; eyes bare; wings clear or spotted; one bristle on face; mouth-opening small; arista pectinated on upper side.

nitidula Fall. 1813. **S.** Sharpham (A.) 19/5/24.

leucostoma Mg. 1830. **G.** Shepperdine (A.) 6/8/24. **S.** Sharpham (A.) 18/8/25, Clevedon (A.) 16/9/41.

nigritella Stenh. 1844. **G.** Painswick (W.) 3/11/00. **S.** Leigh Woods (F.) 12/4/47.

DISCOCERINA Macq. 1835 (CLASIOPA Stenh. 1844)

Very small, brown-pruinose flies; wings greyish; a row of bristles on the face; mouth-opening small; arista pectinated on upper-side; thorax covered with fine, scale-like hairs.

obscurella Fall. 1813. **G.** Painswick (W.), Tortworth (A.) 27/4/27. **S.** Walton Moor (A.) 23/8/47.

plumosa Fall. 1823. **G.** Tormarton (A.) 13/7/29, Coombe Dingle (F.) 30/5/48, Blaise Castle (F.) 5/7/48.

calceata Mg. 1830 (*nigrina* Stenh. 1844). **G.** Painswick (W.) 10/96, Blaise Castle (F.) 5/7/48. **S.** Shepton Mallet (C.).

S. F. HYDROPOTINAE (HYDRELLIINAE)

No bristle on second antennal segment; eyes hairy; mouth-opening small.

OCHTHERA Lat. 1802

Small, brown-black fly with greatly swollen front-femora and a strong spur on front-tibiae; arista pectinated on upper side.

mantis Deg. 1782. **S.** Sharpham (A.) 19/8/25, Shapwick (F.) 28/8/48, Holford (Cw.) 30/8/47.

PHILYGRIA Stenh. 1844 (Hydrina R.D. 1830 *preoc.*)

Very small, black-pruinose flies with only the apex of the abdomen shining ; arista pubescent ; no orbital bristles ; one presutural and two postsutural dorsocentral bristles, one row of acrostichal bristles ; wings either clear with dark spots or dark with milk-white spots.

punctatonervosa Fall. 1813. **S.** Berrow (A.) 29/9/24, 27/8/30 and 26/6/39.

stictica Mg. 1830. **G.** Filton (F.) 5/5/49.

sexmaculata Beck. 1895 (*interstincta* Mg. *nec* Fall.). **G.** Blaise Castle (A.) 13/9/26.

interrupta Hal. 1834. **G.** Blaise Castle (A.) 15/5/36. **S.** Berrow (A.) 6/4/29, Ham Green (F.) 26/4/47.

nigricauda Stenh. 1844. **S.** Berrow (A.) 27/8/30.

PHILYGRIOLA Hend. 1917

Like Philygria, but arista short-pectinated, and wing clear with cross-veins close together.

picta Fall. 1813. **G.** Stone (A.) 27/6/48.

HYADINA Hal. 1834

Like Philygria, but only one postsutural and no presutural dorso-central bristle ; wing dark with a clear spot on either side of the lower cross-vein ; two black velvet spots on scutellum.

guttata Fall. 1813. **G.** Coombe Dingle (F.) 20/3/49. **S.** Clevedon (A.) 5/10/39.

PELINA Hal. 1837

Small, more or less shining, black flies ; eyes and arista bare ; no facial bristles ; mouth-opening small ; one postsutural dorso-central bristle ; acrostichal bristles in two rows.

aenea Fall. 1813. **G.** Shepperdine (A.) 20/7/24.

nitens Lw. 1873. **G.** Coombe Dingle (F.) 13/3/48. **S.** Ham Green (F.) 19/4/47, Sharpham (F.) 28/8/48.

aenescens Stenh. 1844. **G.** Aust (A.) 6/9/22. **S.** Clevedon (F.) 27/5/47.

HYDROPOTA Rond. 1861 (Hydrellia R.D. 1830 *preoc.*)

Small, greyish flies ; eyes hairy ; arista pectinated on upper side ; wing clear ; acrostichal bristles in two rows.

fascitibia v.Ros. 1840. **S.** Easton-in-Gordano (F.) 17/9/49.

nigripes Zett. 1838 var. *cochleariae* Hal. 1839. **G.** Coombe Dingle (F.) 21/9/46. **S.** Clevedon (A.) 18/6/41. Larvae in *Potamogeton crispus* L.

griseola Fall. 1813. **G.** and **S.** Very common ; larvae in Gramineae, Juneaceae, *Potamogeton* spp.

nasturtii Coll. 1928. **G.** Coombe Dingle (F.) 15/9/46, Filton (F.) 8/10/46. Larvae in *Nasturtium* (*Radicula*) *officinale* R.Br.

ranunculi Hal. 1839. **G.** and **S.** Very common ; possibly only a var. of *H. griseola* Fall.

albiceps Mg. 1830. **S.** Ham Green (F.) 19/4/47.

albilabris Mg. 1830. **G.** Hallen (F.) 18/9/47, Filton (F.) 1/10/47.

thoracica Hal. 1839. **S.** Clevedon (A.) 12/8/40, Bleadon (A.) 20/9/41.

S. F. Ephydrinae

Mouth-opening large, often with bristles round the edge ; eyes bare.

EPHYDRA Fall. 1810

Small, metallic, shining flies ; proboscis thick and geniculate ; frons shining, arista pubescent or pectinated ; onychia (claws) straight ; wing clear ; larvae parasitic in aquatic plants.

micans Hal. 1833. **S.** Taunton (P.), Portbury (F.) 7/8/37, Sharpham (F.) 28/8/48, Worle (F.) 8/10/49.

riparia Fall. 1813. **S.** Tickenham (Wm.) 23/7/22, Easton-in-Gordano (F.) 4/9/49.

COENIA R.D. 1830

Like Ephydra, but arista long-pectinated, and claws curved as usual in flies; life-history unknown.

fumosa Stenh. 1844. **S.** Sharpham (F.) 6/9/47, Worle (F.) 8/10/49.

palustris Fall. 1823. **G.** Hallen (F.) 18/9/47. **S.** Sharpham (A.) 6/8/23 and 16/8/25.

SCATELLA R.D. 1830

Very small, brownish-black flies; arista pubescent; wings greyish with black or white patches; life history unknown.

sibilans Hal. 1833. **S.** Clevedon (A.) 18/6/41 and (F.) 13/4/47.

dichaeta Lw. 1860. **G.** Filton (F.) 26/4/47. **S.** Wick (F.) 11/4/47, West Town (F.) 26/4/47.

paludum Mg. 1830 (*sorbillans* Hal. 1833). **G.** Fishponds (A.) 24/3/28. **S.** Keynsham (A.) 1/6/36.

lutosa Hal. 1833. **S.** Ham Green (F.) 26/4/47.

subguttata Mg. 1830 (*aestuans* Hal. 1833). **G.** Coombe Dingle (F.) 15/9/46, Filton (F.) 19/9/46. **S.** Portishead (F.) 25/5/47.

stagnalis Fall. 1823. **G.** and **S.** Common.

quadrata Fall. 1823. **G.** Cirencester (T.), Kingsweston (A.) 6/5/28, Durdham Down (F.) 16/10/46, Filton (F.) 17/3/47, Coombe Dingle (F.) 16/4/47. **S.** Wells (L.), Shepton Mallet (C.) 8/18, Rodney Stoke (A.) 16/4/29.

stenhammari Zett. 1842. **G.** Blaise Castle (F.) 10/4/48.

fallax Cz. 1903. **G.** Brentry (F.) 5/10/47, Blaise Castle (F.) 23/3/49.

SCATOPHILA Beck. 1896

Like Scatella, but costa only reaches apex of second longitudinal vein; wing with nine or ten light spots.

noctula Mg. 1830. **S.** Shepton Mallet (C.) 1/8/09, Tickenham (A.) 2/10/41.

caviceps Stenh. 1844. **G.** Coombe Dingle (F.) 10/5/47.

TEICHOMYZA Macq. 1835

Small, brown flies; arista bare; wing dark without clear spots; larvae coprophagous or saprophagous.

fusca Macq. 1835. **G.** Blaise Castle (Wm.) 14/8/21. **S.** Keynsham (C.) Chewstoke (A.) 24/5/33.

HALMOPOTA Hal. 1856

Small, grey-brown flies; arista bare; one strong bristle under each eye and a few reclinate bristles on the jowls; two presutural dorso-central bristles larvae in saline marshes.

salinarum Bché. 1834. **G.** Aust (A.) 6/9/22.

PARYDRA Stenh. 1844 (Napaea R.D. 1830 *preoc.*)

Like Halmopota, but only one or no presutural dorso-central bristle; first longitudinal vein may have a short downward projecting veinlet near its apex, wing may have dark or light spots; arista slightly pubescent; life-history unknown.

pubera Lw. 1860. **S.** Easton-in-Gordano (F.) 10/9/49.

pusilla Mg. 1830. **G.** Cirencester (T.) 6/8/23, Filton (F.) 1/7/47. **S.** Ashton Park (H.), Clevedon (F.) 23/8/47.

nigritarsis Strobl 1893. **G.** Brentry (F.) 5/10/47. **S.** Clevedon (F.) 27/5/47, Ham Green (F.) 19/4/47.

fossarum Hal. 1833. **G.** Aust (A.) 6/9/22, Shepperdine (A.) 2/8/24, Brentry (F.) 6/10/47, Coombe Dingle (F.) 16/4/47. **S.** Clevedon (A.) 4/6/40, Walton Moor (A.) 23/8/47, Ham Green (F.) 12/4/47.

aquila Fall. 1823. **G.** Littledean (A.) 25/5/31, Blaise Castle (F.) 27/3/48. **S.** Flax Bourton (H.), Tickenham (A.) 24/5/26, Prior Park, Bath (A.) 18/7/25, Clevedon (A.) 22/9/41.

coarctata Fall. 1823. **G.** and **S.** Common.

quadripunctata Mg. 1830. **G.** and **S.** Common.

littoralis Mg. 1830. **G.** Filton (F.) 1/7/47. **S.** Wells (L.), Ham Green (F.) 19/4/47.

Family :—**Canaceidae**

Like Tethinidae, but subcostal vein reaches the costa. Seashore flies.

XANTHOCANACE Hend. 1914 (Dinomyia Beck. 1926 *preoc.*)

Small, dark flies with whitish pubescence ; tibiae reddish.

ranula Lw. 1874. **S.** Berrow (F.) 27/8/49.

Family :—**Sphaeroceridae** (Cypselidae, Borboridae)

Small, black flies with shortened, swollen hind-metatarsus ; vibrissae present ; arista pubescent ; larvae coprophagous or saprophagous.

N.B. (Rch.) = mentioned in O. W. Richards' (1930) paper.

S. F. Sphaerocerinae

Fourth longitudinal vein reaches the edge of the wing ; a spur on hind-tibia.

SPHAEROCERA Lat. 1804

curvipes Lat. 1804 (*subsultans* auctt. *nec* L.). **G.** and **S.** Common.

monilis Hal. 1836 (*tarsalis* Wahlg. 1918). **G.** Cirencester (T.), Durdham Down (F.) 17/3/47, Filton (F.) 17/3/47.

paracrenata Duda 1938. **S.** Sharpham (F.) 23/4/49.

scabricula Hal. 1836. **G.** Coombe Dingle (F.) 13/3/48. Rare.

parapusilla Duda 1920 (*vaporiarum* Rich. *nec* Hal.). **G.** Wotton-under-Edge (P.), Bristol (Ct.) 11/32.

pusilla Fall. 1820 (*denticulata* Mg. 1830). **G.** Hallen (B.) 16/7/26, (Rch.). **S.** (Rch.). On horse dung.

S. F. Borborinae (Cypselinae)

Fourth longitudinal vein does not reach the edge of the wing ; apical spur on hind-tibia, except *B. ater* Mg.

BORBORUS Mg. 1803 (Cypsela Mg. 1800 ?, Olina auctt. *nec* R.D.)

ater Mg. 1830 (*hirtipes* R.D. 1830, *geniculatus* Macq. 1835). **G.** and **S.** Very common.

ALLOBORBORUS Duda 1923 (Trichopoda Rich. *nec* Lioy)

flavipennis Hal. 1836 (*pallifrons* Coll. *nec* Fall.). **S.** Kewstoke (J.) 7/17.

CRUMOMYIA Macq. 1835

nigra Mg. 1830. **G.** and **S.** Common.

glacialis Mg. 1830 (*notabilis* Coll. 1902). **S.** Tickenham (A.) 16/9/22. Rare.

STRATIOBORBORUS Duda 1923 (Fungobia Rich. *nec* Lioy)

fimetarius Mg. 1830 (*suillorum* Hal. 1836). **G.** Blaise Castle (F.) 8/11/47, Coombe Dingle (F.) 7/4/47 and 9/4/48, Filton (F.) 24/6/48. **S.** Shepton Mallet (C.), Clevedon (A.) 12/10/45, (Rch.). In woods.

nitidus Mg. 1830. **G.** and **S.** Common.

roseri Rond. 1880. **G.** Blaise Castle (F.) 18/10/47. In woods on Fungi.

BORBORILLUS Duda 1923

vitripennis Mg. 1830 (*longipennis* Hal. 1836). **G.** Shepperdine (A.) 6/8/24. **S.** Taunton (P.), Highbridge (C.), Wells (L.), (Rch.). On horse dung.

costalis Zett. 1847 (*vitripennis* Hal. *nec* Mg., *opacifrons* Duda 1923). **G.** Filton (F.) 9/10/44. **S.** Sharpham (A.) 22/8/22. On horse dung.

TRICHIASPIS Duda 1923 (COPROMYZA Rich. *nec* Fall.)

stercoraria Mg. 1830. **G.** and **S.** Very common.

equina Fall. 1820. **G.** and **S.** Very common.

similis Coll. 1930. **G.** (Rch.). **S.** Tickenham (A.) 19/6/43, Clevedon (A.) 8/5/47, Edington (Cw.) 1/12/46 and 22/5/47, (Rch.). In woods.

S. F. LEPTOCERINAE

Third and fourth longitudinal veins do not reach the edge of the wing; no spur on hind-tibia.

CULLINELLULA Strand 1926 (RACHISPODA Rich. *nec* Lioy, COLLINELLA Duda 1918 *preoc.*)

varicornis Strobl 1900 (*halidayi* Coll. 1902). **G.** Coombe Dingle (F.) 21/9/46.

lutosa Zett. 1852. **G.** Filton (F.) 1/7/47, Hallen (F.) 18/9/47. **S.** Clevedon (F.) 27/5/47, Walton Moor (F.) 23/8/47. On wet mud.

breviceps Stenh. 1854 var. *cryptochaeta* Duda 1918. **G.** Painswick (W.), Awkley (A.) 5/9/23. **S.** Tickenham (A.) 20/7/23. In woods.

fuscipennis Hal. 1833. **G.** Aust (A.) 6/9/23. **S.** Clevedon (A.) 14/9/40. Estuarine species.

var. *oelandica* Stenh. 1854. **G.** Coombe Dingle (F.) 29/2/48.

limosa Fall. 1820. **G.** and **S.** Common on mud.

PARACOLLINELLA Duda 1923

curvinervis Stenh. 1854. **S.** Wells (L.), (Rch.). In low herbage.

fontinalis Fall. 1827. **G.** Fishponds (A.) 24/3/22, Blaise Castle (A.) 16/3/24, Hallen (F.) 18/9/47, Durdham Down (F.) 20/12/47, Coombe Dingle (F.) 15/2/48, Filton (F.) 8/3/48. **S.** Wells (L.), Clevedon (A.) 3/6/39, Portbury (F.) 22/5/47, Edington (Cw.) 30/3/47.

oldenbergi Duda 1918. **G.** Coombe Dingle (F.) 15/9/46, 22/4/47 and 13/3/48, Filton (F.) 8/3/48.

PTEREMIS Rond. 1856 (STENHAMMARIA Duda 1918)

fenestralis Fall. 1820 (*erratica* Hal. 1836). **G.** Painswick (W.), Bristol (A.) 29/9/27, Blaise Castle (F.) 27/3/49. **S.** Portbury (F.) 22/3/47. In grass and in dwellings.

SPINOTARSELLA Rich. 1929

humida Hal. 1836. **G.** Coombe Dingle (F.) 4/4/47 and 8/6/47. **S.** Taunton (P.), Tickenham (A.) 10/8/33, Edington (Cw.) 6/11/46 and 22/5/47. In ponds, streams or estuarine marshes.

OPACIFRONS Duda 1918

coxata Stenh. 1854. **G.** and **S.** Common.

CHAETOPODELLA Duda 1920

scutellaris Hal. 1836. **G.** Olveston (C.), (Rch.). **S.** Leigh Woods (A.) 2/21, Bleadon (A.) 20/9/41. On carrion and dung.

THORACOCHAETA Duda 1918

brachystoma Stenh. 1854. **G.** Filton (F.) 25/3/47. **S.** Clevedon (A.) 24/9/48, Ham Green (F.) 26/4/47. Estuarine.

zosterae Hal. 1833. **G.** Aust (A.) 6/9/22. **S.** Clevedon (A.) 21/10/40 and (F.) 13/4/47, St. Audries (A.) 24/8/29, Kilve (Cw.) 6/9/48. On decaying seaweed.

LIMOSINA Macq. 1935 (LEPTOCERA auctt. *nec* Oliv., SCOTOPHILELLA Duda 1918)

fungicola Hal. 1836 (*vitripennis* Zett. 1847). **G.** and **S.** Common. In low vegetation and in dwellings.

collini Rich. 1929. **S.** Portbury (F.) 22/3/47. On cow dung.

silvatica Mg. 1830. **G.** Bristol (C.), Durdham Down (F.) 4/11/46, Filton (F.) 1/10/47, Blaise Castle (F.) 20/3/48, Coombe Dingle (F.) 7/6/48. **S.** Clevedon (A.) 21/10/40 and 24/6/44, Edington (Cw.) 10/12/46. In garden refuse and in dwellings.

mirabilis Coll. 1902. **S.** Ham Green (F.) 26/4/47. On manure heaps and in dwellings.

grenstedi Rich. 1929. **S.** Taunton (Gr.) 25/7/27. On cow dung.
ochripes Mg. 1830 (*fulviceps* Rond. 1880). **S.** Wells (L.), Tickenham (A.) 30/8/40. In grass.

bifrons Stenh. 1854. **S.** Ham Green (F.) 26/4/47.

clunipes Mg. 1830 (*crassimana* Hal. 1886). **G.** Filton (F.) 17/3/47, Morton (F.) 10/2/48. **S.** Prior Park, Bath (A.) 18/7/25, St. Audries (A.) 26/8/29.

talparum Rich. 1927. **G.** Filton (F.) 11/2/48, Coombe Dingle (F.) 13/3/48. **S.** West Town (F.) 17/5/47. In Mole runs.

palmata Rich. 1927. **G.** Coombe Dingle (F.) 8/4/47, Blaise Castle (F.) 8/4/47, Filton (F.) 11/2/48. In burrows of small Mammals.

luteilabris Rond. 1880 (*simplicimana* Rond. 1880). **G.** Filton (F.) 17/3/47. **S.** Taunton (P.), Edington (Cw.) 23/3/48. In carrion and in dwellings.

rufilabris Stenh. 1854. **G.** Coombe Dingle (F.) 29/3/47. **S.** Shepton Mallet (C.), Wells (A.) 10/8/25. In grass.

penetralis Coll. 1925. **G.** Filton (F.) 25/3/47. Coombe Dingle (F.) 15/2/48, Blaise Castle (F.) 19/4/48. In refuse and dwellings.

heteroneura Hal. 1836. **G.** Bristol (A.) 29/9/27. In refuse and dwellings.

HALIDAYINA Duda 1918

spinipennis Hal. 1836. **S.** Ham Green (F.) 26/4/47. In refuse and dwellings.

TRACHYOPELLA Duda 1918

leucoptera Hal. 1836. **S.** Shepton Mallet (C.).

COPROPHILA Duda 1918 (HETEROPTERA Macq. 1835 *preoc.*)

acutangula Zett. 1847 (*pusilla* Mg. *nec* Fall.). **G.** Coombe Dingle (F.) 16/4/47. **S.** Taunton (P.), Tickenham (A.) 14/6/40, Clevedon (A.) 16/7/40. On horse and cow dung.

ferruginata Stenh. 1854. **G.** Coombe Dingle (F.) 16/4/47. **S.** Ham Green (F.) 26/4/47. On horse and sheep dung.

lugubris Hal. 1836. **G.** Bristol (C.), Shepperdine (A.) 30/7/24. **S.** (Rch.) On fresh animal dung.

Family :—**Asteidae**

Small, black and yellow flies ; wing with only two convergent, longitudinal veins reaching the edge of the wing ; larvae probably saprophagous.

LEIOMYZA Macq. 1835 (*emend.* LIOMYZA Agassiz 1846)

Two cross-veins in wing ; arista pubescent.

laevigata Mg. 1826. **S.** Clevedon (A.) 5/9/41. Rare.

ASTEIA Mg. 1830

Only one cross-vein, arista plumose.

concinna Mg. 1830. **S.** Tickenham (B.) 19/6/43. Rare.

amoena Mg. 1830. **G.** and **S.** Fairly common.

Family :—**Aulacigastridae**

Small, brown flies ; four longitudinal veins reach edge of wing and the two middle ones are parallel ; larvae in wounds in tree-trunks.

AULACIGASTER Macq. 1835

leucopeza Mg. 1800 (*rufitarsis* Macq. 1835). **G.** Painswick (W.) 6/6/93, Blaise Castle (F.) 24/4/48, Coombe Dingle (F.) 22/5/48. **S.** Wells (L.). Uncommon.

Family :—**Diastatidae** (DROSOPHILIDAE *p.p.*)

Small, brown flies ; wing normal but with distinct, though short, spines on the costa ; arista plumose ; flies found in marshes ; larvae saprophagous.

DIASTATA Mg. 1830

Only one reclinate, orbital bristle ; lower cross-vein darkened in *unipunctata* Zett.

unipunctata Zett. 1847 (? *adusta* Mg. 1830). **S.** Sharpham (A.) 3/8/22 and 10/4/29 Rodney Stoke (A.) 16/4/29. Uncommon.

vagans Lw. 1864. **G.** Filton (F.) 22/5/46.

fuscula Fall. 1823 (*costata* Mg. 1830). **G.** Hallen (A.) 11/9/28, Filton (F.) 11/6/48. Uncommon ; fore-part of wing darkened, rest clear.

CAMPICHAETA Macq. 1835 (THRYPTOCHETA Rond. 1856)

Two reclinate orbital bristles.

obscuripennis Mg. 1830. **G.** Durdham Down (F.) 12/10/46, Blaise Castle (F.) 17/3/49. Rare.

basalis Mg. 1830 (*punctum* Mg. 1830). **S.** Tickenham (A.) 24/4/22. Rare.

Family :—**Camillidae** (DROSOPHILIDAE *p.p.*)

Small, shining, black flies ; wing normal and clear ; arista pectinate above, short-haired below.

CAMILLA Hal. 1838

glabra Fall. 1823. **S.** Wells (L.), Berrow (B.) 18/6/30. Uncommon.

Family :—**Drosophilidae**

Small, yellowish-brown flies ; no upper basal cell ; vibrissae present ; larvae saprophagous (Fruit Flies) or coprophagous.

STEGANA Mg. 1830

Wing dark ; arista pectinate above.

coleoptrata Scop. 1763. **G.** Chalford (F.) 15/7/47. Rare.

CACOXENUS Lw. 1858

Abdomen shining, black ; a trace of upper basal cross-vein ; arista pubescent.

indagator Lw. 1858. **G.** Bristol (B.) 1/5/27. **S.** Clevedon (A.) 21/5/47. Uncommon ; said to be parasitic on *Osmia* spp.

LEUCOPHENGA Mik 1886

Fly with silvery sheen ; arista pectinate ; larvae in *Polyporus imbricatus* Bull. (Fr.).

maculata Duf. 1839. **G.** Blaise Castle (A.) 7/9/29 and (F.) 24/4–8/5/48. **S.** Leigh Woods (A.) 12/4/30, Clevedon (A.) 25/8/41. Not uncommon.

DROSOPHILA Fall. 1823

Arista forked at apex and bearing several hairs above and one or more below.

S. G. PARASCAPTOMYZA Duda 1924

Two rows of acrostichal bristles ; only one hair below on arista.

disticha Duda 1921 (*graminum* Auctt. *nec* Fall.). **G.** and **S.** Very common.

S. G. SCAPTOMYZA Hardy 1850

Four rows of acrostichal bristles ; only one hair below on arista.

flava Fall. 1823 (*apicalis* Hardy 1850). **G.** Bristol (A.) 10/10/31, Blaise Castle (F.) 17/3/49. **S.** Shapwick (A.) 22/4/24, West Town (Wm.) 3/27.

graminum Fall. 1823 (*incana* Mg. 1830, *tetrasticha* Beck. 1908). **G.** Blaise Castle (A.) 11/4/27, Coombe Dingle (F.) 3/5/47. **S.** Clevedon (A.) 16/9/41, Leigh Woods (A.) 12/10/22. Both species uncommon ; larvae parasitic on low-lying plants.

S. G. Drosophila *s.str.*

Usually more than four rows of acrostichal bristles ; several hairs below on arista ; larvae in fruit, fermenting material and fungi.

fenestrarum Fall. 1828. **G.** and **S.** Fairly common.

melanogaster Mg. 1830. **G.** Blaise Castle (A.) 18/2/22, Bristol (A.) 28/9/27. **S.** Clevedon (A.) 14/7/40.

funebris F. 1787. **G.** and **S.** Common.

fasciata Mg. 1830 (*ampelophila* Lw. 1862). **G.** Bristol (Wm.) 3/8/28, Filton (F.) 9/10/47.

phalerata Mg. 1830. **G.** Olveston (C.) 8/10/15, Shepperdine (A.) 23/8/24, Blaise Castle (A.) 28/5/27 and (F.) 19/7/47. **S.** Leigh Woods (H.), Taunton (P.), Wells (L.), Clevedon (A.) 30/9/39, Loxley Wood, Shapwick (Cw.) 6/7/47.

transversa Fall. 1823. **G.** Shepperdine (A.) 23/8/24, Durdham Down (F.) 14/9/46.

buscki Coq. 1901. **G.** Durdham Down (F.) 26/9/46. **S.** Clevedon (A.) 19/1148.

obscura Fall. 1823. **G.** Bristol (A.) 28/9/27 and 1/1/35. **S.** Priddy (A.) 6/6/37, Clevedon (A.) 13/7/40.

var. *tristis* Fall. 1823. **G.** Durdham Down (F.) 28/8/46, Blaise Castle (F.) 26/3/48.

Family :—**Agromyzidae**

Small to very small flies with clear wings ; larvae live mainly in leaves of living plants in which they form tunnels visible from the outside ; each species seems to confine itself to one family or genus of plants and the species of fly can be recognised by the shape of its tunnel.

DIZYGOMYZA Hend. 1920

The two short veins at base of wing (upper part) end separately in the costa which reaches the apex of the third longitudinal vein ; lower, outer cross-vein present ; scutellum black with four bristles.

posticata Mg. 1830. **G.** Blaise Castle (F.) 30/7/49.

capitata Zett. 1848. **G.** Coombe Dingle (F.) 26/6/47. Host unknown.

geniculata Fall. 1823. **G.** Olveston (A.) 30/7/22. Host unknown.

lamii Kalt. 1858. **G.** Coombe Dingle (F.) 17/6/47. Labiatae.

flavifrons Mg. 1830. **S.** Wells (L.). Caryophyllaceae.

morosa Mg. 1830 (*laterella* Zett. 1838). **G.** Olveston (A.) 6/4/22. Juncaceae.

luctuosa Mg. 1830. **S.** Priddy (A.) 6/6/37. Cyperaceae.

bellidis Kalt. 1872 (? *humeralis* v. Ros. 1840). **S.** Clevedon (W.) 8/02. On *Aster* spp. and *Bellis* spp.

AGROMYZA Fall. 1810

The two short veins at base of wing (upper part) coalesce and form a dark lump just as they enter the costa which reaches to the apex of the third longitudinal vein ; lower outer cross-vein present ; halteres white or yellow.

anthracina Mg. 1830. **G.** Blaise Castle (F.) 12/10/47. *Urtica* spp. and *Parietaria* spp.

reptans Fall. 1823. **G.** and **S.** Very common. *Urtica* spp. and *Parietaria* spp.

rufipes Mg. 1830. **G.** Coombe Dingle (F.) 31/8/49. *Boraginaceae* spp.

nigripes Mg. 1830. **S.** St. Audries (A.) 30/8/29, Priddy (A.) 6/6/37, Clevedon (A.) 22/7/40 and 5/5/42. *Phragmites communis* Trin.

spiraeae Kalt. 1867. **G.** Coombe Dingle (F.) 10/5/47, Blaise Castle (F.) 18/10/47. *Spiraea* spp. and Rosaceae.

alnibetulae Hend. 1931 (*albitarsis* Hend. *nec* Mg.). **G.** Cirencester (T.) 25/5/24. *Alnus* spp. and *Betula* spp.

albitarsis Mg. 1830. **G.** Coombe Dingle (F.) 30/5/48. *Populus* spp.

MELANAGROMYZA Hend. 1920

Like Agromyza, but halteres brown or black.

cunctans Mg. 1830. **G.** Coombe Dingle (F.) 24/4/48, Blaise Castle (F.) 25/4/48, Filton (F.) 15/6/48. Host unknown.

pulicaria Mg. 1830. **G.** Doverow (W.) 2/5/93, Cirencester (T.) 17/7/24, Coombe Dingle (F.) 22/5/48, Blaise Castle (F.) 3/7/48. *Taraxacum* spp. and *Sonchus* spp.

schineri Giraud 1861. **S.** Portishead (F.) 24/5/47. Salicaceae.

DOMOMYZA Rond. 1856

Like Agromyza, but costa reaches only to apex of second longitudinal vein or a little beyond it.

mobilis Mg. 1830. **G.** Coombe Dingle (F.) 30/5/48. **S.** Sharpham (A.) 10/9/25. Gramineae.

nana Mg. 1830. **G.** Bristol (F.) 14/4/48. **S.** Walton Moor (F.) 7/5/49. *Medicago* spp. and *Trifolium* spp.

ambigua Fall. 1823. **G.** Coombe Dingle (F.) 28/5/49. *Calamagrostis* spp., *Hordeum murinum* L. and *Triticum vulgare* Vill.

cinerascens Macq. 1835. **G.** Bristol (F.) 14/4/48. *Dactylis glomerata* L.

LIRIOMYZA Mik 1894

Like Dizygomyza, but scutellum partly or wholly yellow.

flavonotata Hal. 1833. **S.** Taunton (P.), Long Ashton (A.) 2/6/34. Host unknown.

flaveola Fall. 1823. **G.** Hallen (A.) 11/9/28. **S.** Sharpham (A.) 22/8/22, Priddy (A.) 6/6/37, Clevedon (A.) 26/11/40. Gramineae.

pusilla Mg. 1830. **G.** Olveston (A.) 30/7/22, Aust (A.) 6/9/22. **S.** Tickenham (A.) 24/4/22. *Euphorbia* spp.

perpusilla Mg. 1830. **G.** Painswick (W.) 5/7/02. Host unknown.

fasciola Mg. 1838. **S.** Clevedon (A.) 14/10/40. *Valeriana* spp.

CERODONTHA Rond. 1861 (Odontocera Macq. 1835 *preoc.*)

Like Dizygomyza, but only two bristles on the scutellum, and the apical antennal segment bears an apical bristle as well as a dorsal arista.

fulvipes Mg. 1830 (*spinicornis* Macq. 1835). **S.** Tickenham (A.) 2/10/41. Host unknown.

denticornis Panz. 1806. **G.** Cirencester (T.), Aust (A.) 6/9/23, Hallen (A.) 11/9/28. **S.** Tickenham (A.) 16/9/22, Sharpham (A.) 22/8/22, Clevedon (A.) 3/9/40. Gramineae.

var. *nigroscutellata* Strobl 1900. **S.** Berrow (A.) 18/9/41.

NAPOMYZA Hal. 1840

Like Dizygomyza, but costa only reaches apex of second longitudinal vein, and lower, outer cross-vein is close to the base of the wing.

elegans Mg. 1830. **S.** Sharpham (F.) 19/6/49.

nigriceps v.d. Wulp. 1871. **S.** Backwell (A.) 25/4/26. Host unknown.

lateralis Fall. 1823. **G.** Doverow (W.) 2/5/93. **S.** Wells (L.), Berrow (A.) 29/9/24. Capitula of Compositae and stem of Umbelliferae.

discrepans v.d.Wulp. 1871. **G.** Kingsweston (A.) 2/5/26. Host unknown.

spinicauda Hend. 1920. **G.** Shepperdine (A.) 30/7/24. Host unknown.

heringi Hend. 1920. **G.** Painswick (W.) 99. *Fraxinus* spp.

PHYTOMYZA Fall. 1810

Like Napomyza, but lower, outer cross-vein absent.

conyzae Hend. 1920. **G.** Edgehill (W.) 19/6/04. *Inula conyza* D.C.

rnaunculi Schrk. 1803 var. *flava* Fall. 1823. **G.** Bristol (C.), Stone (A.) 30/7/28. **S.** Wells (L.). Ranunculaceae.

var. *albipes* Mg. 1830. **G.** Cirencester (T.) 17/8/23, Olveston (A.) 10/6/22, Hallen (A.) 12/7/24. **S.** Clevedon (W.) 29/8/02 and (A.) 4/9/41. Ranunculaceae.

var. *flavoscutellata* Fall. 1823. **G.** Bristol (C.), Blaise Castle (A.) 4/21, Olveston (A.) 2/5/22, Stone (A.) 1/5/27. **S.** Sharpham (A.) 22/4/24. Ranunculaceae.

var. *praecox* Mg. 1830 (*zetterstedti* Schin. 1864). **G.** Coombe Dingle (F.) 7/4/46 and 25/9/46. **S.** Nailsea (A.) 21/4/27, Clevedon (A.) 18/5/40. Ranunculaceae.

flavicornis Fall. 1823. **G.** Cirencester (T.) 12/5/24, Coombe Dingle (F.) 16/4/47. **S.** Portishead (A.) 15/10/22. *Urtica* spp.

rufipes Mg. 1830. **G.** Painswick (W.). *Brassica* spp.

nigra Mg. 1830. **G.** Coombe Dingle (F.) 3/5/47, Blaise Castle (F.) 26/3/48. **S.** Priddy (A.) 6/6/37, Clevedon (A.) 1/9/39. Gramineae.

atricornis Mg. 1838. **G.** Bristol (A.) 22/6/30 and 16/6/35. **S.** Clevedon (A.) 16/9/41. Polyphagous.

affinis Fall. 1823. **G.** Cirencester (T.) 6/23, Bristol (C.), Coombe Dingle (F). 3/5/47. **S.** Wells (L.), Clevedon (A.) 21/10/40, Bleadon (A.) 20/9/41. *Carduus* spp.

plantaginis R.D. 1851. **S.** Clevedon (A.) 24/7/42. *Plantago* spp.

albiceps Mg. 1830. **G.** Bristol (A.) 8/1/22 and (B.) 8/5/26, Shepperdine (A.) 30/8/24, Tockington (A.) 19/4/27. **S.** Tickenham (A.) 7/7/24, Clevedon (A.) 21/10/40. *Chrysanthemum* spp.

ilicis Curt. 1846. **G.** Bristol (C.), Tockington (A.) 8/5/27, Blaise Castle (F.) 2/4/49. **S.** Portishead (A.) 14/5/38. *Ilex aquifolium* L.

insperata Hend. 1927. **S.** Clevedon (A.) 12/10/40. *Solidago virguarea* L.

milii Kalt. 1864 (? *cinereifrons* Hardy 1849). **G.** Cirencester (T.) 3/8/23. Gramineae.

anthrisci Hend. 1924. **S.** Keynsham (A.) 14/5/32. *Anthriscus vulgaris* Pers.

obscurella Fall. 1823. **G.** and **S.** Fairly common. Umbelliferae.

periclymeni Meij. 1924. **S.** Clevedon (A.) 12/6/40. *Lonicera periclymenum* L.

albipennis Fall. 1823. **G.** Bristol (F.) 16/2/46 and 25/5/46. **S.** Clevedon (A.) 12/6/40. Host unknown.

Family :—**Milichiidae**

Very small flies with normal wing, though the two lowest veins are not well marked ; crossed bristles on frons ; these flies attach themselves to larger predatory insects and share their prey ; larvae coprophagous.

PHYLLOMYZA Fall. 1810

The three longitudinal veins are parallel ; eyes hairy.

securicornis Fall. 1823. **G.** Hallen (A.) 8/6/29, Filton (F.) 3/5/48. **S.** Sharpham (A.) 16/8/25. In nests of *Formica rufa* L.

DESMOMETOPA Lw. 1865

Dull-black fly ; second and third longitudinal veins converge ; eyes bare.

albipennis Mg. 1830. **G.** Shepperdine (A.) 11/8/24.

MADIZA Fall. 1810

Like Desmometopa, but shining black.

glabra Fall. 1820. **G.** Bristol (A.) 8/6/29 and (F.) 1/7/48, Coombe Dingle (F.) 6/10/46, Filton (F.) 20/9/48. **S.** Clevedon (A.) 12/8/40 and 1/8/47, Leigh Woods (F.) 12/4/47. Fairly common, has been found in dwellings.

Family :—**Carnidae**

Like Milichiidae, but third longitudinal vein weak, and lower, outer cross-vein absent ; larvae coprophagous in birds' nests.

MEONEURA Rond. 1856

vagans Fall. 1823. **G.** Shepperdine (A.) 30/7/24.

Family :—**Odiniidae**

Small, dark-grey flies with spotted abdomen ; wing normal, clear except for darkened cross-veins ; larvae saprophagous.

ODINIA R.D. 1830

maculata Mg. 1830. **G.** Coombe Dingle (F.) 26/6/47, Durdham Down (F.) 22/8/47.

Family :—**Braulidae**

Small, aptereus flies found in *Apis mellifica* L. (Bee Louse) ; eyes reduced to one ocellus ; no scutellum ; larvae feed on food stores of the Bees.

BRAULA Nitz. 1818

caeca Nitz. 1818. **G.** Shirehampton (A.) 24/9/06. **S.** Batheaston (Bl.), Shepton Mallet (C.).

Family :—**Chloropidae**

Small, yellow and black flies with a well defined ocellar triangle ; vibrissae absent ; inner, lower cross-vein absent, and outer, lower cross-vein situated near base of wing ; larvae usually leaf parasites chiefly on Gramineae, some cause galls and some are parasitic on the eggs of Arachnidae.

S. F. OSCINELLINAE

Costa reaching apex of third longitudinal vein.

ELACHIPTERA Macq. 1835

Black flies with a very thick arista.

megaspis Lw. 1858. **S.** Taunton (P.), Ham Green (F.) 12/4/47. In *Nasturtium* (*Radicula*) *officinale* R.Br.

cornuta Fall. 1820. **G.** and **S.** Common. In cereals and *Brassica* spp.

TRICIMBA Lioy 1864 (NOTONAULAX Beck. 1903)

Dull-black flies ; arista thin and bare ; antennae and legs yellow ; thorax with three, impressed, punctate stripes.

cincta Mg. 1830. **G.** Durdham Down (F.) 31/8/46, Coombe Dingle (F.) 7/9/46. **S.** St. Audries (A.) 18/8/22.

lineella Fall. 1820. **G.** Knowle (Ch.), Awkley (A.) 18/8/22.

CONIOSCINELLA Duda 1929 (OSCINISOMA Lioy *p.p.*)

Wholly dark fly.

frontella Fall. 1820. **G.** Hallen (A.) 12/7/24. Parasite on eggs of Arachnidae.

TRACHYSIPHONELLA End. 1936 (SIPHONELLA Macq. 1835 *p.p.*)

Dark fly with scutellum, humeri and pleura yellow.

pumilio Zett. 1848. **S.** Berrow (A.) 22/6/25.

DICRAEUS Lw. 1873

First longitudinal vein almost as long as the next two.

tibialis Macq. 1835 (*pallidiventris* Macq. 1835). **G.** Durdham Down (F.) 1/7/46. **S.** Clevedon (A.) 16/9/41.

CALAMONCOSIS End. 1911

Like DICRAEUS, but first vein not so long.

laminiformis Beck. 1903. **S.** Edington (Cw.) 6/7/47 and 22/5/48. *Glyceria aquatica* L.

minima Strobl 1893. **S.** Ham Green (F.) 1/7/49. Inquiline in galls of *Lipara* on *Phragmites communis* Trin.

LIPARA Mg. 1830

Moderately large, punctate, dark flies with normal wing.

lucens Mg. 1830. **G.** Avonmouth (R.) 1927. **S.** Walton Moor (F.) 13/6/48, (A.) 19/5/49. Long galls on stems of *Phragmites communis* Trin.

HAPLEGINELLA Duda 1933 (OSCINISOMA Lioy 1864 *p.p.*)

Shining, black flies with dense hairs on thorax.

laevifrons Lw. 1858. **S.** Shapwick (A.) 29/6/39. Coniferae.

MIMOGAURAX Hall. 1937

Shining, black flies with pubescent arista.

niger Cz. 1906. **G.** Coombe Dingle (F.) 6/10/46. Possibly inquiline in *Lipara* galls.

OSCINISOMA Lioy 1864

Small, black flies with fulvous antennae and legs.

cognatum Mg. 1830. **S.** Clevedon (A.) 18/6/40.

OSCINELLA Beck. 1910

Small, black flies with black antennae ; legs may be black or fulvous.

nitidissima Mg. 1838 (*atricilla* Zett. 1838). **G.** Cleve Hill (St.) 29/7/24, Durdham Down (F.) 11/7/47. **S.** Clevedon (W.) 27/8/02 and (A.) 11/6/40, Sharpham (A.) 22/8/23, Berrow (A.) 6/4/29. May be inquiline in *Lipara* galls.

frit L. 1758. **G.** and **S.** Common, on cereals.

pusilla Mg. 1830. **S.** Clevedon (A.) 16/9/41. *Hordeum* spp.

albiseta Mg. 1830 (*maura* auctt. *nec* Fall.). **S.** Clevedon (A.) 11/6/40.

GONIOSPITA Duda 1930 (SIPHONELLA Macq. 1835 *p.p.*)

Like DICRAEUS, but proboscis long and geniculate.

palposa Fall. 1820. **G.** Painswick (W.) 5/94, Shepperdine (A.) 13/8/24. **S.** Tickenham (A.) 16/9/22. Possibly parasitic on eggs of Acridia.

S. F. CHLOROPINAE

Costa extending only to apex of the second longitudinal vein or slightly beyond it.

PLATYCEPHALA Fall. 1820

Moderately small, dark flies with a long, pointed head when seen in profile ; larvae parasitic in *Phragmites communis* Trin.

planifrons F. 1798. **S.** Berrow (A.) 27/8/24. Rare.

MEROMYZA Mg. 1830

Small, yellow and black flies with swollen hind-femora ; first and second longitudinal veins curved upwards.

pratorum Mg. 1830. **G.** and **S.** Common. In *Dactylis glomerata* L.

var. *decora* Frey 1907. **S.** Clevedon (A.) 8/7/46.

saltatrix L. 1761. **G.** Shepperdine (A.) 30/7/24. **S.** Burnham (A.) 7/21. Gramineae

var. *variegata* Mg. 1830. **G.** Shepperdine (A.) 13/8/24. **S.** Tickenham (A.) 20/7/23, Nailsea (A.) 28/7/22, Clevedon (A.) 19/7/42.

var. *nigriventris* Macq. 1835. **S.** Clevedon (A.) 18/8/42.

var. *femorata* Macq. 1835. **G.** Shepperdine (A.) 23/8/24. **S.** West Town (Wm.) 1/8/28, Minehead (C.), Clevedon (A.) 22/7/40.

EURINA Mg. 1830

Small, black and yellow flies ; head triangular in profile ; hind-femora normal ; all longitudinal veins practically straight.

lurida Mg. 1830. **G.** Hallen (A.) 24/9/27. *Phragmites communis* Trin.

CRYPTONEVRA Lioy 1864

flavitarsis Mg. 1830 (*divergens* Lw. 1866). **S.** Walton Moor (Cw.) 28/5 and 21/6/49, bred from *Lipara* galls on *Phragmites communis* Trin.

ANTHRACOPHAGA Lw. 1866

Small, black fly with yellow markings ; arista long, white-pubescent.

strigula F. 1794. **G.** Hallen (A.) 8/5/29, Coombe Dingle (F.) 2/5/48. **S.** Clevedon (F.) 11/5/47. *Brachypodium sylvaticum* Beauv.

DIPLOTAXA Lw. 1863

Small, black and yellow flies with striped thorax and swollen scutellum.

messoria Fall. 1820. **G.** Wotton-under-Edge (P.).

CHLOROPS Mg. 1803

Small, black and yellow flies.

S. G. MELANUM Beck. 1912

Thorax and abdomen black ; proboscis long, slender ; scutellum yellow.

laterale Hal. 1833. **G.** Olveston (A.) 8/18.

S. G. CETEMA Hend. 1907 (CENTOR Lw. 1866 *preoc.*)

Like MELANUM, but proboscis short and thick.

ceresis Fall. 1820. **G.** Coombe Dingle (F.) 26/6/48, Filton (F.) 6/7/48. Gramineae.

myopina Lw. 1866. **G.** Aust (A.) 6/9/22, Filton (F.) 3/7/47. **S.** Tickenham (A.) 19/7/24 and 1/7/33, Kenn Moor (A.) 27/6/39, Clevedon (A.) 25/7/42. Gramineae.

elongata Mg. 1830. **G.** Hallen (A.) 27/6/16, Coombe Dingle (F.) 26/6/48. **S.** Shapwick (A.) 3/9/22, Sharpham (A.) 18/8/25. Gramineae.

S. G. EPICHLOROPS Beck. 1910

Like MELANUM, but abdomen with yellow sides.

puncticollis Zett. 1848. **G.** Filton (F.) 28/6/46.

S. G. CHLOROPS *s.str.*

Body yellow with black or brown stripes on thorax, scutellum somewhat swollen ; probably all parasitic on Gramineae.

laeta Mg. 1830. **G.** Kingsweston (F.) 9/6/46, Filton (F.) 23/7/46, Bristol (F.) 14/7/48. **S.** Tickenham (A.) 19/6/43.

brevimana Lw. 1866 (*fulviceps* Beck. *nec* v. Ros.). **G.** Blaise Castle (F.) 17/7/48. **S.** Clevedon (W.) 25/8/02 and (A.) 16/9/41.

pumilionis Bjerk. 1778. **G.** and **S.** Fairly common ; Gout Fly of cereals.

planifrons Lw. 1866. **G.** Coombe Dingle (F.) 3/7/48. **S.** Flax Bourton (W.).

brunnipes Zett. 1848. **G.** Awkley (A.) 1/9/23, Kingsweston (A.) 30/3/29. **S.** Shapwick (A.) 20/5/23, Clevedon (A.) 14/5/27.

troglodytes Zett. 1848. **G.** Awkley (A.) 1/9/23, Kingsweston (A.) 30/3/29.

gracilis Mg. 1830. **S.** Holford (Pn.).

interrupta Mg. 1830. **G.** Hallen (A.) 12/7/24, Dursley (A.) 20/6/25, Olveston (A.) 2/9/23. **S.** Brockley Combe (A.) 31/8/33, Wells (L.), Leigh Woods (F.) 11/6/49.

rufina Zett. 1848. **S.** Tickenham (A.) 23/7/22.

hypostigma Mg. 1830 (*minuta* Lw. 1866). **G.** and **S.** Common. *Dactylis glomerata* L.

meigeni Lw. 1866 (*nasuta* auctt. *nec* Schrk.). **G.** Bristol (A.) 20/10/31, Kingsweston (A.) 6/5/23 and 6/4/33. **S.** Dunster (A.) 8/16.

scalaris Mg. 1830 (*didyma* Zett. 1848). **G.** Hallen (A.) 30/9/23, Durdham Down (F.) 19/7/46. **S.** Leigh Woods (A.) 22/5/26, West Town (Wm.) 10/7/27, Shapwick (A.) 29/6/29.

speciosa Mg. 1830. **G.** Olveston (A.) 30/8/23.

nigrithorax Strobl 1909. **S.** Long Ashton (Bw.) 23/8/45.

CHLOROPISCA Lw. 1866

Like CHLOROPS, but a row of fine hairs bordering the ocellar triangle and the scutellum flattened and bare. Gramineae.

glabra Mg. 1830. **G.** Olveston (A.) 4/6/22. **S.** Clevedon (A.) 25/7/42.

THAUMATOMYIA Zenk. 1833 (CHLOROPISCA Lw. 1866 *p.p.*)

Like CHLOROPISCA, but scutellum hairy.

notata Mg. 1830 (*circumdata* Mg. 1830). **G.** and **S.** Common.

rufa Macq. 1835. **G.** Bristol (C.) and (F.) 19/4/48, Durdham Down (F.) 16/7/46, Coombe Dingle (F.) 13/3/48, Blaise Castle (F.) 26/3/48. **S.** Shepton Mallet (C.), Clevedon (A.) 12/6/40 and 15/7/42.

trifasciata Zett. 1848. **S.** Whitchurch (A.) 27/5/35.

SUB-DIVISION :—CALYPTERAE (THECOSTOMATA)

Squamae always present, often large ; there is a chitinous sac at the base of the proboscis ; the second antennal segment is slit.

Family: **Cordiluridae**

Medium-sized to large flies ; wing normal, second longitudinal vein usually turned upwards near apex, no costal spine ; squamae small ; eyes separated in both sexes ; no hypopleural bristles ; flies predaceous ; larvae saprophagous or phytophagous.

S. F. CORDILURINAE

Palpi filiform, usually with an apical bristle ; prothoracic bristles present.

CORDILURA Fall. 1810 (CORDYLURA Mg. 1826)

Mainly shining, black flies with long, narrow abdomen ; two presutural dorso-central bristles ; legs with strong bristles ; arista plumose ; found in damp situations.

pubera L. 1758. **G.** Wotton-under-Edge (P.), Coombe Dingle (F.) 26/6/48, Blaise Castle (F.) 26/6/48, Filton (F.) 16/6/49. **S.** Taunton (Pa.), Chewstoke (A.) 19/5/23, Edington (Cw.) 5/5/48, Loxley Wood, Shapwick (Cw.) 2/7/47.

ciliata Mg. 1826. **G.** Awkley (A.) 5/9/23, Dursley (A.) 13/10/30. **S.** Shapwick (A.) 3/9/22, Sharpham (A.) 7/8/23, Catcott (Cw.) 15/9/47 and 27/5/48.

umbrosa Lw. 1873. **G.** Olveston (C.) 5/18. **S.** Tickenham (A.) 12/5/29 and 11/7/31, Shapwick (A.) 29/6/39 and (Cw.) 25/5/48, Kenn Moor (A.) 19/6/41, Edington (Cw.) 9/5/44 and 17/5/47.

PARALLELOMA Beck. 1894

Like CORDILURA, but some yellow on body and only one presutural dorso-central bristle.

albipes Fall. 1819. **G.** and **S.** Fairly common.

CNEMOPOGON Rond. 1856

Shining, black flies ; palpi without apical bristle ; three sternopleural bristles ; apical antennal segment long, arista pubescent.

apicalis Wied. 1826. **S.** Edington (Cw.) 17/8/46, 17/5/47 and 18/8/48, Catcott (Cw.) 24/8/47, Shapwick (Cw.) 25/5/48, Street Heath, Sharpham (F.) 23/4 and 21/5/49.

LEPTOPA Zett. 1837

Shining, fulvous fly ; palpi with apical bristle ; one sternopleural bristle, apical antennal segment short, arista pubescent ; eyes slightly reniform ; edge of mouth bristly.

filiformis Zett. 1838. **G.** Coombe Dingle (F.) 14/7/46. Rare.

MEGAPHTHALMA Beck. 1894

Like LEPTOPA, but palpi without apical bristle and arista short-plumose.

pallidum Fall. 1819. **G.** Coombe Dingle (F.) 19/6/47. **S.** Clevedon (A.) 27/8/40, West Town (F.) 28/6/47, Buncombe (Cl.) 8/9/48.

AMAUROSOMA Beck. 1894

Smaller, greyish-black flies ; palpi without apical bristle ; three sternopleural bristles ; apical antennal segment long, arista bare.

flavipes Fall. 1819. **S.** Shepton Mallet (C.).

fasciatum Mg. 1826. **G.** Coombe Dingle (F.) 8/5/47, Filton (F.) 6/5/48. **S.** Keynsham (A.) 15/5/22, Clevedon (A.) 14/5/27 and 14/5/40 and (F.) 11/5/47, Moreton (A.) 17/5/32, Nailsea (A.) 1/5/26 and (Wm.) 21/4/27, Portishead (F.) 24/5/47, Loxley Wood, Shapwick (Cw.) 8/5/48.

inerme Beck. 1894. **S.** Sharpham (A.) 17/8/25.

S. F. SCATOMYZINAE

Palpi filiform, without apical bristle ; prothoracic bristles reduced to fine hairs ; one sternopleural bristle ; body covered with fine hairs.

SCOPEUMA Mg. 1800 (SCATHOPHAGA Mg. 1803, SCATOPHAGA auctt. *nec* Mg.)

Yellow flies with yellow or orange frons ; abdomen of male covered with long, soft hairs, of female with short, depressed hairs.

S. G. SCOPEUMA *s.str.*

Arista plumose.

taeniopus Rond. 1866. **G.** Filton (F.) 28/5/46. **S.** Taunton (A.) 6/6/31.

ordinatum Beck. 1894. **G.** Blaise Castle (A.) 28/5/27, Filton (F.) 22/5/46, Bristol (F.) 25/5/46, Coombe Dingle (F.) 11/6/46. **S.** Shepton Mallet (C.), Shapwick (F.) 11/4/46, Clevedon (A.) 22/4/45.

maculipes Zett. 1846. **G.** Cirencester (T.) 4/6/23, Coombe Dingle (F.) 11/4/46 and 24/5/47, Filton (F.) 22/5/46. **S.** Shepton Mallet (C.), Tickenham (A.) 22/4/25, Keynsham (A.) 14/5/32, Clevedon (A.) 29/5/39.

suillium F. 1794. **G.** and **S.** Common.

anale Mg. 1826. **G.** Wotton-under-Edge (P.). **S.** Clevedon (A.) 18/4/39.

inquinatum Mg. 1826. **G.** and **S.** Common. Possibly just a var. of *lutarium* F.

lutarium F. 1794. **G.** and **S.** Common.

stercorarium L. 1758. **G.** and **S.** Very common.

merdarium F. 1794. **G.** and **S.** Very common. Probably just a var. of *stercorarium* L.

S. G. SCATINA R.D. 1830

Arista bare.

squalida Mg. 1826 (? *furcata* say 1823). **G.** and **S.** Fairly common.

decipiens Hal. 1832. **G.** Painswick (W.), Brentry (F.) 6/10/47.

SCATOMYZA Fall. 1810

Like SCOPEUMA, but grey flies with bare arista ; coastal species.

litorea Fall. 1819. **G.** and **S.** Common.

CERATINOSTOMA Mde. 1885

Black flies covered in both sexes with short, depressed hairs ; legs mainly black ; arista plumose ; coastal species.

ostiorum Hal. 1832. **G.** Aust (A.) 19/8/33. **S.** Brean Down (A.) 27/8/24, St. Audries (A.) 20/8/29, Clevedon (A.) (23/7/40 and (F.) 11/5/47, Portishead (F.) 24/5/47.

S. F. NORELLIINAE

Black and yellow, bare flies with rows of spines on fore-femora and tibiae ; palpi filiform.

NORELLISOMA Hend. 1910 (NORELLIA auctt. *nec* R.D. 1830)

Two rows of spines on fore-femora and tibiae.

spinimanum Fall. 1819. **G.** and **S.** Common.

armipes Mg. 1826. **G.** Hallen (A.) 13/6/25. **S.** Prior Park, Bath (A.) 8/5/26 and 4/6/30, Moreton (A.) 20/7/23, Clevedon (A.) 29/5/39, Backwell (A.) 13/5/34, Keynsham (A.) 5/5/35.

S. F. HYDROMYZINAE

Palpi spathulate ; arista bare ; one or two sternopleural bristles, no prothoracic bristle.

HYDROMYZA Fall. 1813

Greyish flies with reduced frontal bristles and with one sternopleural bristle ; larvae parasitic in leaves of *Nuphar luteum* Sm.

livens F. 1794. **G.** Freshford (A.) 5/6/37.

TRICHOPALPUS Rond. 1856

Rather small, dark-grey fly with normal frontal bristles and one sternopleural bristle.

fraternus Mg. 1826. **S.** Ham Green (F.) 19/4/47, Walton Moor (F.) 28/8/47, Edington (Cw.) 10/7/48.

S. F. CLEIGASTRINAE

Like Hydromyzinae, but palpi normal and prothoracic bristle present.

CLEIGASTRA Macq. 1835 (CLIDOGASTRA Agassiz 1846)

Like TRICHOPALPUS, but shining black and with two distinct sternopleural bristles.

nigrita Fall. 1819. **S.** Sharpham (F.) 23/4/49.

Family :—**Larvaevoridae** (TACHINIDAE)

Hypopleural bristles and vibrissae present ; arista bare ; post-scutellum well developed ; body bristly ; in wing, third longitudinal vein bent more or less angularly near apex, the bent up part may reach the costa (first posterior cell open) or it may fuse with the second longitudinal vein either at the costa (first posterior cell closed) or some distance from the costa (first posterior cell petiolate) ; the third longitudinal vein may continue in a straight line beyond the bend—the portion beyond the bend is called a hang-vein ; larvae are parasitic on the larvae or imagines of other insects.

S. F. SALMACIINAE (GONIINAE)

Prosternum hairy, prealar bristle as long as the nearest dorso-central bristle ; chiefly parasitic on Lepidoptera.

NEOPALES Coq. 1910 (PALES R.D. 1830 *preoc.*)

Medium-sized, bluish-black flies ; eyes hairy ; first posterior cell open ; palpi black ; tibiae rufous.

pavida Mg. 1824 (*cilipeda* Rond. 1859). **G.** and **S.** Common.

var. *pumicata* Mg. 1824. **G.** Coombe Dingle (F.) 15/9/46, Durdham Down (F.) 21/9/47.

ZENILLIA R.D. 1830 (EXORISTA auctt. *nec* Mg.)

Medium-sized, grey-pruinose, black flies ; eyes hairy ; apical scutellar bristles reclinate ; first posterior cell open.

S. G. EUMEA R.D. 1863

mitis Mg. 1824. **G.** Filton (F.) 5/2/48, Coombe Dingle (F.) 24/4/48 and 9/5/48. **S.** Walton Moor (F.) 13/6/48.

spernenda Zett. 1844 (*westermanni* Zett. 1844 *preoc.*). **G.** Kingsweston (F.) 9/6/46, Filton (F.) 17/9/46, Coombe Dingle (F.) 9/5/48, Bristol (F.) 5/6/48. **S.** Clevedon (A.) 1/5/42 and 25/8/44, Loxley Wood, Shapwick (F.) 28/8/48.

hortulana Mg. 1824 (*blepharipoda* B.B. 1891). **G.** Fishponds (Bch.) ; Bristol (F.) 21/5/46. **S.** Portishead (Bt.).

S. G. PLATYMYA R.D. 1830

nemestrina Mg. 1824 (*fimbriata* Mg. 1824). **G.** Stroud (Da.) 8/04, Blaise Castle (F.) 25/4/48.

S. G. PSEUDOPERICHAETA B.B. 1890

insidiosa R.D. 1863 (*roseanae* B.B. 1891). **G.** Stroud (Da.), Coombe Dingle (F.) 23/6/45, Filton (F.) 27/8/47. **S.** Clevedon (A.) 13/7/40 and (Bd.) 1/8/42.

S. G. APLOMYA R.D. 1830

confinis Fall. 1820. **S.** Tickenham (A.) 15/8/40, Clevedon (A.) 29/7/40 and 15/6/41.

S. G. PHEBELLIA R.D. 1846

glauca Mg. 1824. **G.** Painswick (W.), Stroud (Da.), Fishponds (Bch.), Bristol (A.) 11/8/46, Filton (F.) 24/7/46, Durdham Down (F.) 18/8/46, Coombe Dingle (F.) 7/9/46.

diligens Zett. 1844 (*cincinna* Rond. 1859). **G.** Cranham (Wt.).

S. G. PHORCIDA R.D. 1863

lota Mg. 1824. **G.** Coombe Dingle (F.) 14/7/46. **S.** Loxley Wood, Shapwick (F.) 21/6/47, Walton Moor (F.) 5/6/48, Edington (F.) 20/6/48.

S. G. ETHILLA R.D. 1863

tritaeniata Rond. 1859. **G.** Stroud (Da.) 17/5/20.

ELODIA R.D. 1863 (ARRHINOMYIA B.B. 1890)

First posterior cell just closed ; palpi black ; body shining, black ; legs black ; eyes bare.

cloacellae Kram. 1910. **G.** Coombe Dingle (F.) 30/5/48.

HEBIA R.D. 1830

Grey-pruinose fly ; first posterior cell narrowly open or just closed ; legs yellow ; eyes bare.

flavipes R.D. 1830. **G.** Blaise Castle (F.) 25/4/48.

CYZENIS R.D. 1863 (MONOCHAETA B.B. 1890)

Small, light-grey flies ; only one orbital bristle ; first posterior cell narrowly open ; legs black, tibiae fulvous ; eyes hairy.

albicans Fall. 1810. **G.** Kingsweston (A.) 27/5/34, Littledean (A.) 5/6/32, Coombe Dingle (F.) 9/5/48, Blaise Castle (F.) 8/5/48. **S.** Taunton (Pa.), Backwell (A.) 25/4/26, Clevedon (A.) 17/5/40 and 15/5/41, West Town (F.) 1/6/47.

PHRYNO R.D. 1830

Yellowish-pruinose fly ; basal segments of antennae, scutellum and legs fulvous; first posterior cell open ; eyes hairy.

vetula Mg. 1824. **G.** Littledean (A.) 5/6/22. **S.** Leigh Woods (Wm.) 25/4/26, Heaven's Gate, Frome (Ch.) 14/6/25, Clevedon (A.) 12/6/40.

EPICAMPOCERA Macq. 1850

Shining, black, slightly grey-pruinose fly ; first posterior cell narrowly open ; eyes hairy.

succincta Mg. 1824. **G.** Filton (F.) 10/5/45, Coombe Dingle (F.) 11/5/45, Durdham Down (F.) 27/9/47. **S.** Moreton (A.) 21/5/33, Clevedon (A.) 27/7/40 and 26/8/46, Tickenham (A.) 31/7/45, Coxley, Wells (F.) 1/6/46, Edington (F.) 19/6/48.

PHRYXE R.D. 1830

Grey-pruinose flies with fulvous scutellum ; apical scutellar bristle erect ; first posterior cell open ; eyes hairy.

vulgaris Fall. 1810. **G.** and **S.** Common.

nemea Mg. 1824. **G.** and **S.** Common.

LYDELLA R.D. 1830

Like PHRYXE, but scutellum black and apical bristles reclinate ; eyes bare.

grisescens R.D. 1830 (*senilis* Mg. 1838). **G.** Hallen (K.) 26/7/27. **S.** Tickenham (A.) 15/8/40, Clevedon (A.) 20/6/34 and 28/5/43, Walton Moor (F.) 24/8/47.

stabulans Mg. 1824. **G.** Selsley (Wt.), Painswick (W.). **S.** Cheddar (W.) 2/8/98, Backwell (A.) 17/7/26, Long Ashton (A.) 2/6/34, Clevedon (A.) 14/5/27 and 17/6/41, Sharpham (A.) 30/6/42.

RACODINEURA Rond. 1861 (RHACODINEURA auctt. *nec* Rond.)

Densely yellowish-pruinose flies ; palpi, basal segments of antennae and part of legs fulvous ; turned up portion of the third longitudinal vein usually absent ; eyes bare.

antiqua Mg. 1824 (*pallipes* Fall. 1820 *p.p.*). **G.** and **S.** Fairly common.

CARCELIA R.D. 1830

Densely grey-pruinose flies with fulvous scutellum and tibiae ; first posterior cell open ; eyes hairy.

S. G. CARCELIA *s.str.*

bombylans R.D. 1830. **G.** Bristol (F.) 6/7/48.

excavata Zett. 1844 (*gnava* Mg. 1824 *p.p.*). **G.** Stroud (Fl.) 7/7/34, Coombe Dingle (F.) 2/5/46 and 9/5/48. **S.** Clevedon (A.) 26/8/40 and (Bd.) 24/7/42.

obesa Zett. 1859 (*rutilla* B.B. *nec* Rond.). **G.** Stroud (Da.).

lucorum Mg. 1838 (*comata* Rond. 1859, *cheloniae* Rond. 1859). **G.** and **S.** Common.

S. G. EURYCLEA R.D. 1863

phalaenaria Rond. 1859. **G.** Coombe Dingle (F.) 25/4/48. **S.** Clevedon (A.) 28/5/40 and (B.) 27/4/45, Walton Moor (F.) 13/6/48, Barrow Gurney (F.) 27/6/48.

WINTHEMYA R.D. 1830

Like CARCELIA, but legs wholly black.

S. G. WINTHEMYA *s.str.*

variegata Mg. 1824 (*nigrithorax* Egg. 1861). **G.** Coombe Dingle (F.) 10/6/47.

S. G. CHETOLIGA Rond. 1856 (CHAETOLYGA auctt.)

amoena Mg. 1824. **G.** Coombe Dingle (F.) 22/4/45.

NEMORILLA Rond. 1856

Small, greyish-pruinose flies ; legs black ; in male, antennae and palpi black, in female, antennae and palpi partly rufous ; bend of third longitudinal vein rectangular, first posterior cell open ; eyes hairy.

floralis Fall. 1820. **G.** and **S.** Very common.

SMIDTIA R.D. 1830 (EPICAMPOCERA Macq. 1850, MEGALOCHAETA B.B. 1890)

Like WINTHEMYA, but abdomen tessellated.

conspersa Mg. 1824. **G.** Littledean (A.) 25/5/31, Coombe Dingle (F.) 2/5/48. **S.** Clevedon (A.) 6/5/41 and 15/5/41, West Town (F.) 17/4/49.

SALMACIA Mg. 1800 (GONIA Mg. 1803)

Large grey-pruinose flies with basal segments of antennae, palpi and scutellum rufous ; first posterior cell narrowly open or just closed ; eyes bare.

sicula R.D. 1830 (*fasciata* Mg. 1826 *preoc.*). **G.** Kingsweston (A.) 5/4/25, Damery (F.) 23/3/46, Filton (F.) 11/3/48. **S.** Crook Peak (Hw.) 13/4/25, Clevedon (A.) 15/5/41.

divisa Mg. 1826. **S.** Shapwick (F.) 14/4/46.

ornata Mg. 1826. **S.** Berrow (A.) 8/4/29.

S. F. PHOROCERINAE

Prosternum hairy, prealar bristle shorter and weaker than the nearest dorsocentral bristle.

PHOROCERA R.D. 1830 (CHETOGENA Rond. 1859)

Grey-pruinose, medium-sized flies ; palpi and scutellum partly fulvous ; legs black ; first posterior cell open or just closed ; eyes hairy ; male genitalia large.

assimilis Fall. 1810. **G.** Coombe Dingle (F.) 22/4/46 and 8/5/48, Blaise Castle (F.) 25/4/48. **S.** Tickenham (A.) 5/21, West Town (F.) 25/5/47.

vernalis R.D. 1830 (*caesifrons* Macq. 1850). **G.** Selsley (Wt.), Littledean (A.) 5/6/32. **S.** Leigh Woods (A.) 7/5/32, West Town (F.) 25/5/47.

EXORISTA Mg. 1803 (TACHINA auctt. *nec* Mg. 1803)

Medium-sized, grey-pruinose flies ; antennae black ; palpi fulvous ; first posterior cell open and reaching costa high above apex of wings ; hang-vein present, bend of third longitudinal vein rectangular ; eyes bare or slightly pubescent.

larvarum L. 1758. **G.** Blaise Castle (A.) 9/21, Filton (F.) 18/8/48. **S.** Walton Moor (F.) 24/8/47.

var. *fasciata* Fall. 1820. **S.** Portishead (Bt.).

simulans Mg. 1824 (*rustica* Mg. 1838). **G.** Cirencester (T.). **S.** Taunton (Pa.) Moreton (A.) 23/6/34, Tickenham (A.) 15/8/40, Clevedon (A.) 1/9/39 and 24/8/48, Shepton Mallet (A.) 25/6/42, Edington (A.) 5/8/47.

var. *minor* Wain. 1932. **G.** Filton (F.) 26/6/46.

var. *erucarum* Rond. 1859. **G.** Painswick (W.), Coombe Dingle (F.) 13/6/48. **S.** Edington (F.) 21/6/47 and 20/6/48.

PODOTACHINA B.B. 1891 (THRYCHOLYGA auctt. *nec* Rond. 1856)

Like EXORISTA, but larger ; eyes hairy and male with bunch of fulvous hairs on genitalia.

sorbillans Wied. 1830. **S.** Portishead (Bt.). Host is *Saturnia pavonia* L.

BESSA R.D. 1863 (PTYCHOMYIA B.B. 1889)

Small, grey-pruinose flies ; palpi, antennae and legs black ; apical antennal segment very long ; first posterior cell open, trace of hang-vein ; eyes bare.

selecta Mg. 1824. **G.** Cirencester (T.).

CEROMASIA Rond. 1856 (LYDELLA R.D. 1830 *p.p.*)

Medium-sized, greyish-pruinose flies with tessellated abdomen ; legs black ; first posterior cell narrowly open or just closed ; eyes bare.

S. G. BLONDELIA R.D. 1830

nigripes Fall. 1820. **G.** Blaise Castle (A.) 15/5/26, Rodborough (Fl.) 2/6/36. **S.** Clevedon (A.) 17/7/41 and (An.) 18/7/42.

S. G. OSWALDIA R.D. 1830

muscaria Fall. 1810 (*sordidisquama* Zett. 1844). **G.** Wyre Forest (Wt.) 18/6/10, Littledean (A.) 25/5/31 and 5/6/32, Fishponds (Wh.) 9/33, Coombe Dingle (F.) 9/5/48. **S.** Portishead (A.) 19/4/28, West Town (F.) 17/5/47, Loxley Wood, Shapwick (F.) 21/6/47.

MEIGENIA R.D. 1830

Small, grey-pruinose flies with dark markings on abdomen ; first posterior cell narrowly open or just closed ; antennae, palpi and legs black ; eyes bare.

mutabilis Fall. 1811 (*floralis* auctt. *nec* Fall.). **G.** and **S.** Common. Hosts are Coleoptera.

var. *pilosa* Baran. 1927. **S.** Clevedon (A.) 17/5/40.

var. *bisignata* Mg. 1924. **G.** Selsley (Wt.), Cranham (Wt.), Filton (F.) 24/8/46. **S.** Clevedon (A.) 19/5/42.

MYSTACELLA v.d. Wulp 1890

Resembles MEIGENIA, but has hairy eyes.

majuscula Rond. 1859. **S.** Winford Down (F.) 28/8/37. Rare.

BIOMYA Rond. 1856 (VIVIANIA Rond. 1861)

Like MEIGENIA, but palpi fulvous and abdomen unspotted.

cinerea Fall. 1811. **G.** Dursley (A.) 15/7/31. **S.** Edington (F.) 19/6/48.

COMPSILURA Bché. 1834 (MACHAEREA Rond. 1859)

Medium-sized, grey-pruinose flies ; ocellar bristles absent ; palpi yellow ; antennae and legs black ; first posterior cell open ; female with serrate venter and sickle-shaped ovipositor.

concinnata Mg. 1824 (*serriventris* Rond. 1859). **G.** Coombe Dingle (F.) 13/6/48, Filton (F.) 12/7/48. **S.** Long Ashton (Bch.) 3/5/35, Clevedon (Bd.) 21/7/42, 26/8/43, 30/3/44 and 31/7/45 and (F.) 29/8/48.

ANACHAETOPSIS B.B. 1889

Small, shining, black flies ; first posterior cell petiolate ; antennae, palpi and legs black ; eyes bare.

ocypterina Zett. 1838. **G.** Filton (F.) 4/6/46 and 11/6/48. **S.** Sharpham (St.) 31/5/36, Clevedon (A.) 13/7/40, Edington (F.) 19/6/49.

MEDINA R.D. 1830 (DEGEERIA Mg. 1838)

Small, shining, black flies with some white pruinosity ; first posterior cell narrowly open ; antennae, palpi and legs black ; eyes bare.

luctuosa Mg. 1824. **S.** Brockley Combe (A.) 31/8/33.

CROCUTA Mg. 1800 (SIPHONA auctt. *nec* Mg. 1803, BUCENTES Lat. 1809)

Small, yellow-pruinose flies ; first posterior cell narrowly open or just closed ; antennae, palpi and legs (except tarsi) fulvous ; proboscis long, slender, doubly geniculate ; second longitudinal vein setulose as far as middle cross-vein ; eyes bare.

geniculata Deg. 1776. **G.** and **S.** Very common.

cristata F. 1805. **G.** and **S.** Common.

maculata Staeg. 1849. **G.** and **S.** Fairly common.

ACTIA R.D. 1830 (THRYPTOCERA Macq. 1835 *p.p.*)

Small flies, usually shining black, sometimes partly fulvous ; first posterior cell narrowly open or just closed ; one, two or three of the longitudinal veins setulose ; antennae, palpi and legs black or fulvous ; eyes bare.

antennalis Rond. 1859 (*aristalis* Rond. 1865). **G.** Shepperdine (A.) 20/8/24. **S.** Clevedon (An.) 18/7/42.

frontalis Macq. 1845. **G.** Stroud (Da.) 4/6/03, Filton (F.) 17/5/49.

crassicornis Mg. 1824. **G.** Stroud (Da.) 7/8/03, 24/6/08 and 18/7/08, Bristol (H.). **S.** Taunton (Pa.), Clevedon (A.) 23/8/39, 29/6/40 and 19/8/44.

pilipennis Fall. 1811 (reducta Villen. 1920). **G.** Bristol (B.) 22/7/26 and (A.) 29/7/37, Kingsweston (F.) 9/6/46, Coombe Dingle (F.) 26/6/48, Blaise Castle (F.) 17/7/48, Filton (F.) 19/7/48. **S.** West Town (Wm.) 21/8/28, Clevedon (A.) 28/7/39 and 19/8/44.

fissicornis Strobl 1910. **G.** Coombe Dingle (F.) 9/5/48, Blaise Castle (F.) 5/7/48. **S.** Clevedon (A.) 3/8/44.

bicolor Mg. 1824. **S.** Walton Moor (Lw.) 30/4/49.

anomala Zett. 1849. **G.** Stroud (Da.) 31/8/04.

PROCRASPEDOTHRIX Towns. 1932 (CRASPEDOTHRIX auctt. *nec* B.B. 1893)

Like a black ACTIA, but all veins bare.

zonella Zett. 1844. **G.** Stroud (Da.) 24/5/03.

PHYTOMYPTERA Rond. 1845

Small, shining, black fly ; third longitudinal vein has no turned-up portion and there is no lower, outer cross-vein ; antennae, palpi and legs black ; eyes bare.

nitidiventris Rond. 1845. **G.** Stroud (Da.) 12/5/03, Coombe Dingle (F.) 2/7/49.

S. F. LARVAEVORINAE (TACHININAE)

Prosternum bare ; no facial carena ; antennae inserted in upper half of the face ; frontal bristles reaching below the insertion of the antennae.

CAMPYLOCHETA Rond. 1859

Brownish-black pruinose flies ; first posterior cell narrowly open or just closed ; antennae black ; palpi fulvous ; legs black with fulvous tibiae ; eyes hairy.

obscura Fall. 1811 (*praecox* Mg. 1824). **G.** Blaise Castle (F.) 26/3/48. **S.** Walton Moor (F.) 7/5/49.

VORIA R.D. 1830

Fairly large, grey-pruinose flies ; first posterior cell open, hang-vein present, lower outer cross-vein very oblique ; legs black ; antennae and palpi may be partly fulvous ; eyes bare in the following species.

S. G. ATHRYCIA R.D. 1830

trepida Mg. 1824. **G.** Selsley (Wt.), Cirencester (T.) 27/6/24, Durdham Down (F.) 30/5/47, Coombe Dingle (F.) 9/5/48, Bristol (F.) 5/6/48, Filton (F.) 9/6/48. **S.** Moreton (A.) 23/6/44, Shepton Mallet (A.) 24/6/42, Clevedon (A.) 18/5/39, 30/7/40 and 2/7/41.

var. *curvinervis* Zett. 1844. **G.** Bristol (F.) 22/8/48, Coombe Dingle (F.) 4/6/49, Filton (F.) 29/7/49. **S.** Walton Moor (F.) 5/6/48.

var. *ruficornis* Zett. 1844. **G.** Filton (F.) 31/8/49. **S.** Leigh Woods (F.) 17/6/45, Street Heath, Sharpham (F.) 22/5/49.

S. G. VORIA *s.str.*

ruralis Fall. 1811. **G.** Selsley (Wt.), Chalford (Wt.). **S.** Taunton (Pa.), Burnham (A.) 9/20, Ham Green (A.) 10/20, Tickenham (A.) 30/8/40, Clevedon (A.) 4/9/40, 5/9/43 and 16/9/44.

WAGNERIA R.D. 1830 (PHORICHETA Rond. 1861)

Shining, black flies ; first posterior cell petiolate, second longitudinal vein setulose as far as middle cross-vein ; antennae and legs black ; palpi black or fulvous ; eyes bare ; found in sandy situations.

S. G. WAGNERIA *s.str.*

carbonaria Panz. 1798 (*nigrans* Mg. 1826). **S.** Berrow (A.) 8/9/20 and 6/21, and (F.) 27/8/49.

lentis Mg. 1824. **G.** Filton (F.) 23/5/46, Durdham Down (F.) 15/9/46, Coombe Dingle (F.) 15/5/46 and 2/5/48, Blaise Castle (F.) 8/7/48. **S.** Cadbury Camp (F.) 12/5/46.

S. G. RAMONDA R.D. 1863

succincta Mg. 1838. **G.** Olveston (A.) 2/7/22.

NEAERA R.D. 1830

Thorax densely grey-pruinose, abdomen shining black ; wing milky, first posterior cell closed ; antennae, palpi and legs black ; eyes bare.

albicollis Mg. 1824. **G.** Filton (F.) 26/8/46.

LYDINA R.D. 1830 (SOMOLIA Verr. *nec* Rond. 1865)

Shining, black flies, first posterior cell narrowly open or just closed ; antennae, palpi and legs black ; eyes hairy.

aenea Mg. 1824. **G.** Clifton (H.), Cirencester (T.), Shepperdine (A.) 13/8/24, Hallen (A.) 1/8/29, Filton (A.) 22/3/35 and (F.) 18/8/48, Bristol (F.) 5/6/48. **S.** Clevedon (W.) 18/8/01 and (A.) 31/7/41, St. Audries (A.) 24/8/29.

BIGONICHETA Rond. 1845 (*emend.* DIGONOCHAETA Scudd. 1882)

Rather small, grey-pruinose flies, first posterior cell narrowly open or just closed, one or more longitudinal veins setulose ; antennae and legs black ; palpi may be fulvous ; eyes slightly hairy.

spinipennis Mg. 1824. **G.** Bristol (B.) 23/6/27 and (F.) 26/4/46, Filton (F.) 11/7/46. **S.** Clevedon (A.) 26/7/39. Usual host is *Forficula* spp.

ERNESTIA R.D. 1830

Fairly large, dark-pruinose flies; first posterior cell open, hang-vein may be present; legs black; antennae and palpi may be black or fulvous; apical antennal segment short; eyes hairy.

S. G. ERNESTIA *s.str.* (PANZERIA R.D. 1830)

rudis Fall. 1811. **G.** and **S.** Common.

nielseni Villen. 1921 (*minor* Villen. 1917 *preoc.*). **G.** Coombe Dingle (F.) 9/5/48. **S.** Freshford (A.) 28/5/38, Clevedon (A.) 24/4/43, Shapwick (Pch.) 21/4/36.

vagans Mg. 1824. **G.** Coombe Dingle (F.) 22/4/46.

S. G. FAUSTA R.D. 1824

nemorum Mg. 1824 (*pectinata* Girsch. 1881). **G.** Tormarton (A.) 13/7/29.

S. G. VARICHAETA Speis 1903 (ERIGONE R.D. 1830 *preoc.*)

radicum F. 1794. **G.** and **S.** Very common.

consobrina Mg. 1824. **G.** Blaise Castle (F.) 24/4/48, Coombe Dingle (F.) 7/6/48, Filton (F.) 18/8/48. **S.** Clevedon (A.) 30/7/40 and 24/8/48.

connivens Zett. 1844. **G.** Coombe Dingle (F.) 15/5/48. **S.** Cadbury Camp (F.) 12/5/46.

LYPHA R.D. 1830

Olive-brown pruinose flies; first posterior cell narrowly open or just closed; wing brownish tinged in upper part and a cross-vein clouded; antennae and legs black; palpi partly fulvous; eyes hairy.

dubia Fall. 1811. **G.** and **S.** Fairly common in woods in the spring.

GYMNOCHETA R.D. 1830

Shining, green fly, resembling a LUCILIA, but with bare arista; first posterior cell open, antennae, palpi and legs black; eyes hairy; hang-vein present.

viridis Fall. 1811. **G.** and **S.** Fairly common in the spring; males on tree-trunks.

CHRYSOSOMOPSIS Towns. 1916

Like GYMNOCHETA, but palpi yellow and no hang-vein.

aurata Fall. 1820. **G.** Rodborough (Fl.) 17/7/43. First British record.

LINNEMYA R.D. 1830 (MICROPALPUS Macq. 1835)

Medium-sized, black and fulvous flies; palpi rudimentary; first posterior cell open, hang-vein present; antennae black; legs partly fulvous; eyes hairy.

vulpina Fall. 1811. **S.** Cheddar (C.), Brown Down, Otterford (Cw.) 24/8/49. Found on *Erica* spp.

BITHIA R.D. 1863

Yellowish-pruinose, medium-sized flies; first posterior cell narrowly open, veins setulose; antennae, palpi and legs all partly fulvous; eyes bare.

spreta Mg. 1824. **G.** Painswick (W.) 6/92, Shepperdine (A.) 4/8/24, Hallen (A.) 24/9/27, Chalford (F.) 7/9/47. **S.** Tickenham (A.) 19/7/24 and 10/8/33, Clevedon (A.) 22/9/41, Edington (F.) 5/7/47, Walton Moor (F.) 29/8/48.

ERIOTHRIX Mg. 1803 (OLIVIERIA R.D. 1830)

Medium-sized elongated fly, black with sealing-wax red patches on abdomen; first posterior cell either just closed or shortly petiolate, short hang-vein may be present; antennae, palpi and legs black; arista bare; eyes hairy.

rufomaculatus Deg. 1776 (*lateralis* F. 1775 *preoc.*) var. *monochaeta* Wain. 1928. The species and its var. both **G.** and **S.** Common, often found on *Senecio jacobaea* L.

prolixus Mg. 1824. **G.** Painswick (W.), Selsley (Wt.), Stroud (Br.), Filton (F.) 22/7/49. **S.** Sharpham (St.) 4/6/27, Walton Moor (F.) 13/6/48. (N.B. Recorded as RHYNCHISTA auctt. *nec* Rond. 1861.)

DEMOTICUS Macq. 1854

Medium-sized, bluish-grey pruinose flies ; first posterior cell narrowly open ; antennae black ; palpi fulvous ; legs black with fulvous tibiae ; eyes bare.

plebejus Fall. 1811. **G.** Cirencester (T.) 11/7/24. **S.** Sharpham (A.) 22/4/24.

LARVAEVORA Mg. 1900 (TACHINA Mg. 1803, ECHINOMYIA Dum. 1805)

Large flies either wholly black (*grossa*) or fulvous with black stripes ; first posterior cell open ; antennae fulvous with large, black, apical segment ; palpi fulvous ; legs black and fulvous ; eyes bare.

S. G. LARVAEVORA *s.str.*

Palpi filiform.

grossa L. 1758. **S.** Dundry (C.), Banwell (J.), Cheddar (J.), Porlock (Bt.), Ashcott (A.) 2/8/22, Sharpham (A.) 10/8/25, Shapwick (F.) 5/2/45, Portbury (F.) 7/8/44, Priddy (F.) 15/8/45, Holford (Cw.) 30/8/47 and 20/8/49.

fera L. 1761. **G.** Cranham (W.), Cirencester (T.), Kingsweston (A.) 20/5/22 and 10/8/33. **S.** Minehead (Bl.), Dunster (A.) 8/16, St. Audries (A.) 19/8/29, Berrow (A.) 18/9/41, Clevedon (A.) 26/7/40.

S. G. FABRICIELLA Bezzi 1906 (FABRICIA R.D. 1830 *preoc.*)

Palpi spathulate.

ferox Panz. 1809. **G.** Westbury-on-Trym (F.) 27/8/44. **S.** Wellington (Bl.) Portishead (Bt.), Shapwick (Bt.), Tickenham (A.) 20/7/23, St. Audries (A.) 19/2/29, Portbury (F.) 7/2/44, Long Ashton (Bw.) 17/8/45, Street Heath, Sharpham (Cw.) 28/8/48.

SERVILLIA R.D. 1830

Large, shining, dark flies more or less covered with long, yellow hairs ; first posterior cell open ; palpi fulvous ; antennae and legs partly fulvous ; eyes bare.

lurida F. 1781. **G.** Coombe Dingle (F.) 4/6/45. **S.** Axbridge (Rd.), Bridgwater (Sl.), Freshford (A.) 28/5/38.

ursina Mg. 1824. **G.** Bristol (C.), Wyre Forest (Wt.) 24/3/94. **S.** Clevedon (W.), Leigh Woods (H.), Sharpham (A.) 17/4/24.

ANTHOICA Rond. 1861 (MYOBIA R.D. 1830 *preoc.*)

Medium-sized, elongated, greyish-yellow flies ; first posterior cell narrowly open ; antennae partly fulvous ; palpi fulvous ; legs fulvous with black tarsi ; eyes bare.

S. G. ANTHOICA *s.str.*

inanis Fall. 1811. **S.** Clevedon (A.) 8/7/40.

S. G. SOLIERIA R.D. 1848 (MICROMYOBIA B.B. 1891)

pacifica Mg. 1824 (*tibialis* v.Ros. 1840, *diaphana* Rond. 1861). **G.** Selsley (Wt.), Cirencester (T.) 4/7/24, Olveston (A.) 30/7/22, Hallen (B.) 9/7/27, Filton (A.) 29/5/35. **S.** Tickenham (A.) 24/6/26, Clevedon (A.) 20/6/34, 31/8/41 and 25/8/44.

vacua Rond. 1861. **G.** Kingsweston (A.) 24/10/36.

THELAÏRA R.D. 1830

Medium-sized, grey-pruinose, black flies with red patches on the abdomen of the male ; first posterior cell open, first two longitudinal veins setulose ; arista plumose ; antennae and legs black ; palpi yellow ; eyes bare.

leucozona Panz. 1809 (*nigripes* F. 1794 *preoc.*). **G.** and **S.** Common.

ZOPHOMYIA Macq. 1835

Medium-sized, bluish-black flies without pruinosity ; first posterior cell narrowly open, wing with a bright-yellow patch at the base ; antennae and legs black ; palpi brownish ; eyes hairy.

temula Scop. 1763. **G.** Selsley (Br.) 15/5/94. **S.** Sharpham (A.) 29/6/29 and 30/6/42, Clevedon (A.) 23/6/41 and 10/6/47, Walton Moor (A.) 4/6/48 and (F.) 13/6/48, Coxley, Wells (F.) 6/8/45, Edington (F.) and (Cw.) 20/8/48, Catcott (Cw.) 20/6/48.

MACQUARTIA R.D. 1830

Small, slightly pruinose, black flies; first posterior cell narrowly open; antennae and legs black; palpi black or yellow, eyes hairy.

S. G. MACQUARTIA *s.str.*

dispar Fall. 1820. **G.** Coombe Dingle (F.) 2/10/48 and 4/6/49. **S.** Edington (F.) 19/6/48.

nubilis Rond. 1862. **G.** Chalford (Wt.), Coombe Dingle (F.) 3/7/45 and 2/5/48. **S.** Rodney Stoke (A.) 6/4/29, Loxley Wood, Shapwick (F.) 24/4/49.

praefica Mg. 1824 (*spinicincta* Mde. 1891). **G.** Sheepscombe (St.) 18/6/27, Morton (F.) 14/7/47, Filton (F.) 20/9/48. **S.** Sharpham (A.) 2/8/25 and 3/8/33, Shepton Mallet (A.) 29/6/42.

buccalis R.D. 1830. **G.** Blaise Castle (F.) 30/8/44, Coombe Dingle (F.) 14/5/49.

chalconota Mg. 1824. **G.** Cranham (Wt.), Cirencester (T.) 14/10/24. **S.** Taunton (Pa.).

var. *tenebricosa* Mg. 1824. **G.** Cranham (Wt.), Yanworth (J. Collins). **S.** Brockley Combe (A.) 21/8/33, Sharpham (A.) 3/8/35, Clevedon (A.) 17/7/40 and 11/8/41, Walton Moor (A.) 4/6/48, Edington Burtle (F.) 27/8/49.

var. *nitida* Zett. 1838. **G.** Hallen (A.) 24/9/27, Filton (F.) 27/7/49. **S.** Sharpham (A.) 24/8/25.

S. G. CLEONICE R.D. 1863

grisea Fall. 1811. **G.** Blaise Castle (F.) 2/5/48. **S.** Cadbury Camp (F.) 12/5/46, Portishead (F.) 24/5/47, Failand (F.) 31/5/47, Walton Moor (F.) 30/4/49, Blagdon (F.) 8/10/49.

BLEPHAROMYIA B.B. 1889

Medium-sized, grey-pruinose flies, abdomen tessellated, first posterior cell narrowly open; antennae, palpi and legs black, apical antennal segment dilated; especially in the male; eyes hairy.

amplicornis Zett. 1844. **G.** Coombe Dingle (F.) 19/4/48 and 8/5/48. **S.** West Town (F.) 17/4/49.

S. F. DEXIINAE

Prosternum bare; facial carena present; antennae inserted in lower half of face; frontal bristles not reaching level of insertion of antennae; arista plumose eyes bare; viviparous and larvae parasitic on Coleoptera.

DEXIOSOMA Rond. 1856

Somewhat large, greyish-yellow flies; first posterior cell open, long hang-vein present; antennae, palpi and legs fulvous; no ocellar bristles.

caninum F. 1781. **G.** and **S.** Common. On *Melolontha melolontha* L.

DEXIA Mg. 1826

Like DEXIOSOMA, but ocellar bristles present and hang-vein short or absent.

vacua Fall. 1816. **G.** Wickeridge Hill (W.). **S.** Cheddar (C.) and (Cw.) 6/8/45.

rustica F. 1775. **G.** Wotton-under-Edge (P.), Morton (F.) 14/7/47. **S.** Tickenham (A.) 20/7/23, Clevedon (A.) 3/8/44, Portbury (F.) 24/8/47, Loxley Wood, Shapwick (F.) 28/8/48.

MYOCERA R.D. 1830

Medium-sized, grey-pruinose flies; first posterior cell open; antennae and legs black; palpi fulvous.

carinifrons Fall. 1816. **S.** St. Audries (A.) 24/8/29.

DINERA R.D. 1830

Like Myocera, but first posterior cell closed or petiolate, antennae and legs partly fulvous.

grisescens Fall. 1816. **S.** Clevedon (An.) 17/6/43, Edington (F.) 17/6/49.

TRIXA Mg. 1824

Rather large, rotund, black flies with some rufous patches on abdomen in the male ; first posterior cell open, short hang-vein present, cross-veins heavily clouded ; antennae short and fulvous ; legs black with rufous tibiae or wholly rufous ; palpi fulvous.

oestroidea R.D. 1830. **G.** Cirencester (T.) 26/6/24, Filton (A.) 22/5/35 and (F.) 24/9/48, Coombe Dingle (F.) 3/7/48. **S.** Hutton(J.), Tickenham (A.) 24/6/24, St. Audries (A.) 26/8/29, Clevedon (A.) 12/9/40 and 15/6/41, Sharpham (A.) 30/6/42.

S. F. Phasiinae

Prosternum bare ; chaetotaxy much reduced ; no facial carena, arista bare ; ovipositor extruded ; mainly parasitic on Hemiptera.

ALOPHORA R.D. 1830

Wing broad, more or less clouded, first posterior cell petiolate ; male and female differ in colour and size (female smaller) ; antennae and legs black ; palpi black or fulvous.

S. G. Alophora *s.str.*

Large flies ; pleura with rufous hair ; abdomen flat, reddish.

hemiptera F. 1794. **G.** Chalford (Wt.), Charlton Abbot (Wtl.) 31/7/46, Coombe Dingle (F.) 26/6/48. **S.** Loxley Wood, Shapwick (Cw.) 4/7/45 and (F.) 20/6/48.

S. G. Hyalomya R.D. 1830

Medium-sized fly, pleura with black hairs ; abdomen round.

obesa F. 1798. **G.** Durdham Down (F.) 21/9/47, Coombe Dingle (F.) 26/6/48, Filton (F.) 3/9/48 and 7/9/49.

S. G. Paralophora Girsch. 1887

Small, black fly ; abdomen round, shining-black in male, grey-pruinose in female ; wing clear.

pusilla Mg. 1824. **G.** Selsley (Br.), Chalford (Wt.), Cirencester (T.) 18/5/23, Kingsweston (Wm.) 17/7/32, Hallen (A.) 20/7/24, Durdham Down (F.) 21/9/47, Filton (F.) 16/7/48. **S.** Norton Fitzwarren (F.) 24/7/48.

LOPHOSIA Mg. 1824

Medium-sized, black, slightly pruinose, elongated flies ; first posterior cell open, wing with a dark band across ; antennae and legs brownish-black ; palpi fulvous.

fasciata Mg. 1824. **G.** Coombe Dingle (F.) 25/6/45 and (Lw.) 18/7/47. Probably parasitic on *Tortrix viridana* L.

WEBERIA R.D. 1830

Small, shining, black flies ; first posterior cell narrowly open or just closed ; antennae, palpi and legs black ; genitalia bent in under the abdomen.

pseudofunesta Villen. 1931 (*curvicauda* auctt. *nec* Fall.). **G.** Durdham Down (F.) 26/7/47.

DUFOURIA R.D. 1830 (Minella R.D. 1830)

Small, shining, black flies ; first posterior cell narrowly open or just closed, antennae, palpi and legs black ; eyes hairy.

chalybeata Mg. 1824. **G.** Selsley (Wt.), Painswick (W.), Cirencester (T.) 4/7/24, Sheepscombe (St.) 18/6/27, Kingsweston (A.) 12/6/27, Hallen (A.) 13/6/26, Olveston (A.) 18/6/22, Coombe Dingle (F.) 30/5/48, Filton (F.) 2/7/48. **S.** Tickenham (A.) 1/7/33, Clevedon (A.) 20/6/34.

nigrita Fall. 1811. **G.** Hallen (A.) 13/6/26. **S.** Shapwick (A.) 29/6/39.

PARAFEBURIA Towns : 1932 (PLESINA auctt. *nec* Mg. 1838. EUPLESINA Wain. 1933)

Small, shining, black flies with silvery pruinosity on the humeri ; first posterior cell petiolate, apical portion of wing with dark cloud, third longitudinal vein and lower outer cross-vein clouded ; antennae and palpi fulvous ; legs black.

maculata Fall. 1820. **G.** Olveston (A.) 8/10/20, Rodborough (Fl.) 7/8/41, Durdham Down (F.) 1/9/47.

S. F. OESTRINAE

A ventral membrane present between tergites and sternites of abdomen ; no sternopleural bristle ; hypopleural bristles replaced by a row of hairs ; mouth organs absent.

OESTRUS L. 1758

Moderately large, black and white flies ; antennae short, basal segments fulvous, apical black, arista bare, fulvous ; legs fulvous ; first posterior cell petiolate ; Sheep Nostril Fly.

ovis L. 1758. **G.** Painswick (W.), Bristol (Bw.) 11/5/45.

Family :—**Sarcophagidae**

Post-scutellum reduced or absent ; propleura bare ; colour non-metallic, black or grey.

S. F. RHINOPHORINAE

Antennae inserted in lower half of face ; arista pubescent or shortly plumose ; thoracic (lower) squama narrow, not reaching the scutellum ; mainly black flies ; parasitic on Crustacea (Isopoda : Wood Lice).

MELANOPHORA Mg. 1803

Small, shining, black flies ; first posterior cell petiolate, wing blackish all over ; antennae, palpi, legs and squamae black.

roralis L. 1758. **G.** Bristol (C.), Painswick (W.), Cirencester (T.), Rodborough (Fl.) 19/6/34, Downend (Bw.) 12/8/45, Filton (C. Diaper) 8/6/48. **S.** Leigh Woods (H.), Portishead (Bt.), Brean (Cw.) 27/8/49. On *Porcellio scaber* Lat.

RHINOPHORA R.D. 1830 (CLISTA Mg. 1838)

Like MELANOPHORA, but wings not so dark, squamae white.

lepida Mg. 1826. **G.** and **S.** Common. On *Porcellio scaber* Lat.

PHYTO R.D. 1830

Medium-sized, grey-pruinose flies ; first posterior cell shortly petiolate, wing clear ; antennae and legs black ; palpi fulvous ; eyes bare.

melanocephala Mg. 1824. **G.** Painswick (W.) 12/8/91, Selsley (Wt.), Cirencester (T.), Coombe Dingle (F.) 19/8/46. **S.** Clevedon (W.) and (A.) 15/6/40 and 17/8/42, Tickenham (A.) 24/6/24, Taunton (A.) 6/6/31. On *Armadillum vulgare* Lat., *Oniscus asellus* L. and *Porcellio scaber* Lat.

STYLONEURIA B.B. 1891

S. G. PROTACHAETA End. 193/

Like PHYTO, but palpi black. Same hosts.

discrepans Pand. 1896. **G.** Bristol (F.) 5/6/48, Durdham Down (F.) 7/9/46. **S.** Clevedon (A.) 20/6/34, 11/8/40, 28/5/44 and 23/6/45, Cadbury Camp (F.) 12/5/46.

FRAUENFELDIA Egg. 1865

Small, grey-pruinose, black flies ; first posterior cell just closed, antennae partly fulvous ; palpi fulvous ; legs black with fulvous tibiae ; eyes bare.

trilineata Mg. 1824 (*rubricosa* Mg. 1824). **G.** Bristol (F.) 30/5–1/7/48, Filton (F.) 14/7/48. On *Porcellio scaber* Lat.

S. F. SARCOPHAGINAE

Arista plumose ; three sternopleural bristles in one row ; second longitudinal vein setulose ; larvae mainly saprophagous.

MORINIA R.D. 1830

Very small, shining, black fly ; third longitudinal vein bent gently, not angularly, towards the second, first posterior cell open, upper part of wing dark ; eyes bare ; antennae, palpi and legs black.

nana Mg. 1826. **G.** and **S.** Fairly common.

NYCTIA R.D. 1830

Like MORINIA, but larger and third longitudinal vein bent angularly, with hang-vein ; posterior cell open, just closed or petiolate ; palpi brown.

halterata Panz. 1798. **G.** and **S.** Common.

SARCOPHAGA Mg. 1826

Large, grey flies (Flesh Flies) with shifting, dark tessellations on abdomen ; eyes bare ; first posterior cell open ; palpi black ; arista plumose in basal half.

S. G. BELLIERIA R.D. 1863

hirticrus Pand. 1896. **S.** Clevedon (A.) 30/7/40, 26/8/42 and 16/8/45.

melanura Mg. 1826. **S.** Dunster (A.) 8/16, Berrow (A.) 27/8/24, Clevedon (A.) 23/7/40 and 11/8/45, Edington (Cw.) 8/6/49.

rosellei Böttch. 1912. **G.** Bristol (F.) 18/4/48, Coombe Dingle (F.) 24/4/48, Filton (F.) 2/6/48. **S.** Keynsham (A.) 1/6/31, Clevedon (A.) 1/6/39, 25/9/40 and 21/4/46, Shepton Mallet (A.) 29/6/42, Edington (Cw.) and (F.) 20/6/48, Moorlinch (Cw.) 10/6/49.

agnata Rond. 1860. **S.** Keynsham (A.) 24/5/36.

crassimargo Pand. 1896. **G.** Bristol (A.) 12/7/47, Morton (F.) 13/4/46, Filton (F.) 18/6/46, Durdham Down (F.) 22/8/47. **S.** Clevedon (A.) 1/6/29, 10/5/40 and 1/8/40, Edington (Cw.) 4/8/49.

S. G. KRAMERIMYIA *nom. nov.* (KRAMERELLA End. 1928 *preoc.*)

setipennis Rond. 1860. **G.** Painswick (W.), Selsley (Wt.), Cirencester (T.), Filton (F.) 2/7/46. **S.** Clevedon (A.) 13/6/41, Moorlinch (Cw.) 10/6/49, Edington (Cw.) 11/6–4/8/49.

S. G. THYRSOCNEMA End. 1928

clathrata Mg. 1826 var. *nigrans* Pand. 1896. **G.** Filton (F.) 11/6/48.

subulata Pand. 1896 (*laciniata* Pand. 1896). **S.** Clevedon (A.) 13/6/41.

incisilobata Pand. 1896 (*privigna* Pand. 1896 *preoc*, *striata* Mg. 1826 *preoc.*). **G.** Selsley (W.), Tormarton (A.) 13/7/29, Filton (A.) 22/5/35, Durdham Down (Wm.) 9/5/20, Kingsweston (A.) 25/6/31. **S.** Clevedon (A.) 23/8/39, 22/7/40 and 5/6/41, Edington (Cw.) 24/6/48 and 7–13/6/49.

villeneuvei Böttch. 1912. **S.** Clevedon (A.) 26/8/40, Walton Moor (F.) 5/6/48.

humilis Mg. 1826 (*nigriventris* Mg. 1826). **G.** Painswick (W.), Cirencester (T.), Sheepscombe (St.) 20/7/24, Kingsweston (A.) 25/6/31, Durdham Down (F.) 20/9/47. **S.** Berrow (K.) 17/7/27 and (A.) 8/4/29, Sharpham (A.) 22/4/24, Rodney Stoke (A.) 6/4/29, Clevedon (A.) 13/5/39, 30/7/40, 16/8/41 and 11/8/45, Edington (Cw.) 8–11/8/49.

S. G. PARASARCOPHAGA J. and T. 1921

teretirostris Pand. 1896. **G.** Filton (A.) 29/5/35. **S.** Long Ashton (A.) 2/6/34, Shepton Mallet (A.) 6/7/42, Clevedon (A.) 22/7/40 and 6/8/44, Edington (A.) and (Cw.) 5/7/47.

caerulescens Zett. 1838 (*scoparia* Pand. 1896). **G.** Kingsweston (A.) 9/8/33. **S.** Clevedon (A.) 1/6/39, 2/7/41 and 24/6/45.

aratrix Pand. 1896. **G.** Selsley (Wt.), Painswick (W.) 21/7/91, Tormarton (A.) 13/7/29, Filton (A.) 12/5/34, Kingsweston (A.) 25/6/31. **S.** St. Audries (A.) 24/8/29, Tickenham (A.) 30/7/40, Clevedon (A.) 26/7/40 and 3/8/44.

S. G. SARCOPHAGA *s.str.*

carnaria L. 1758. **G.** and **S.** Very common.

subvicina Rohd. 1937 (*vicina* Villen. 1899 *preoc.*). **G.** and **S.** Common.

S. G. COPROSARCOPHAGA Rohd. 1937

haemorrhoidalis Fall. 1816. **G.** Bristol (C.), Cirencester (T.). **S.** Taunton (A.) 6/6/31, Tickenham (A.) 6/21.

S. G. PIERRETIA R.D. 1863

pumila Mg. 1826. **G.** Cirencester (T.). **S.** Sharpham (A.) 26/8/22 and 2/6/36, Clevedon (A.) 2/7/41, Edington (Cw.) 8/6–3/8/49, Moorlinch (Cw.) 10/6/49.

filia Rond. 1860. **G.** Selsley (Wt.).

haemorrhoa Mg. 1826. **G.** Kingsweston (A.) 21/6/24, Bristol (C.), Coombe Dingle (F.) 18/6/46, Filton (F.) 16/6/48. **S.** Sharpham (A.) 1/8/25, Clevedon (A.) 30/7/39, Shepton Mallet (A.) 29/6/42, Walton Moor (F.) 13/6/48, Edington (Cw.) 8/6–4/8/49.

obscurata Rohd. 1937 (*offuscata* Schin. 1862 *preoc.*). **G.** Tormarton (A.) 13/7/29, Filton (F.) 11/9/46. **S.** Tickenham (A.) 23/6/29, Leigh Woods (F.) 17/6/45, Edington (F.) 11/6/48.

dissimilis Mg. 1826. **G.** and **S.** Common.

vagans Mg. 1826 (*frenata* Pand. 1896). **G.** Cirencester (T.) 26/6/24, Kingsweston (A.) 9/8/33, Coombe Dingle (F.) 6/5/45, Bristol (F.) 15/4/46. **S.** Tickenham (A.) 1/7/33, Clevedon (A.) 5/8/40 and (F.) 29/8/48, Edington (Cw.) 24/6/48 and 8/6–9/8/49.

var. *cruenta* Pand. 1896. **G.** Kingsweston (A.) 25/6/31. **S.** Long Ashton (A.) 2/6/34, Clevedon (A.) 22/7/40 and 15/6/41, Shepton Mallet (A.) 23/6/42, Cheddar (W.) 22/8/98.

vicina Macq. 1835 (*ebrachiata* Pand. 1896). **G.** Amberley (E. Bury.).

S. G. ARHOPOCNEMIS End. 1928

sinuata Mg. 1826. **G.** Chalford (Wt.). **S.** Clevedon (A.) 12/9/40, Edington (Cw.) 29/6/49.

S. G. RAVINIA R.D. 1863

haematodes Mg. 1826 (*striata* F. 1794 *preoc.*). **G.** Bully (W.), Cirencester (T.). **S.** Tickenham (A.) 30/8/40, Clevedon (A.) 1/9/40, Edington (Cw.) 4/8/49.

BLAESOXIPHA Lw. 1861

Like SARCOPHAGA, but differing mainly in male and female genitalia.

S. G. SERVAISIA R.D. 1863

erythrura Mg. 1805. **S.** Edington (Cw.) 7–23/6/49 and (F.) 23/6/49.

rossica Villen. 1911. **S.** Edington (A.) 5/7/47.

HELICOBOSCA Bezzi 1900 (THERIA R.D. 1830 *preoc.*)

Like SARCOPHAGA, but palpi fulvous.

palpalis R.D. 1830 (*distinguenda* Villen. 1924). **S.** Loxley Wood, Shapwick (F.) 28/8/48, Edington (Cw.) 8/6–3/8/49.

S. F. METOPIINAE

Two sternopleural bristles ; frons equally wide in both sexes ; cleptoparasites on Hymenoptera Aculeata.

METOPIA Mg. 1803

Medium-sized, grey-pruinose, black flies ; frons conically protruding and in male of *argyrocephala* looks as if it were silver-plated ; first posterior cell open ; hang-vein present ; antennae, palpi and legs black ; eyes bare.

argyrocephala Mg. 1824 (*leucocephala* Rossi 1790 *preoc.*). **G.** Cranham (Wt.), Coombe Dingle (F.) 7/6/47. **S.** Ham Green (F.) 7/7/46, Walton Moor (F.) 12/6/49.

campestris Fall. 1820. **G.** Bitton (C.). **S.** Leigh Woods (C.) 5/8/07.

PTYCHONEURA B.B. 1889 (? OEBALIA R.D. 1863)

Small, yellow-pruinose flies with black markings on abdomen ; first posterior cell open ; antennae black, arista bare ; palpi with fulvous apex ; legs black with fulvous tarsi.

melaleuca Mg. 1824 (*rufitarsis* Mg. 1824). **G.** Blaise Castle (F.) 5/7/48. **S.** Clevedon (A.) 16/6/39, Ham Green (F.) 7/7/46.

BRACHICOMA Rond. 1859

Medium-sized, grey-pruinose flies ; first posterior cell open, hang-vein present ; antennae, palpi and legs black ; arista slightly pubescent ; eyes bare.

devia Fall. 1820. **G.** Cirencester (T.), Filton (F.) 24/8/46, Blaise Castle (F.) 8/7/48, Bristol (F.) 22/8/48. **S.** Dunster (A.) 8/16, Tickenham (A.) 23/6/29, Clevedon (A.) 17/7/40, 18/8/48 and 11/8/45, Moorlinch (Cw.) 10/6/49. Cleptoparasite on *Bombus* spp.

PACHYOPHTHALMUS B.B. 1889 (AMOBIA R.D. 1830 *preoc.*)

Like BRACHICOMA, but dark spots on abdomen and arista bare.

signatus Mg. 1824. **G.** Coombe Dingle (F.) 7/6/47, Bristol (Bu.) 1/7/48, Blaise Castle (F.) 8/7/48. **S.** Leigh Woods (F.) 5/6/49.

MACRONICHIA Rond. 1859 (MOSCHUSA R.D. 1863)

Like BRACHICOMA, but frons prominent and arista bare, may have dark spots on abdomen.

polyodon Mg. 1824. **G.** Coombe Dingle (F.) 8/5/48, Blaise Castle (F.) 8/7/48.

ungulans Pand. 1895. **G.** Bristol (F.) 12/6/48, Blaise Castle (F.) 5/7/48. **S.** Clevedon (A.) 8/7/44, Leigh Woods (F.) 20/7/47.

SENOTAINIA Macq. 1846 (SPHIXAPATA Rond. 1859, *emend.* SPHECAPATA Bezzi 1906)

Small, light-grey pruinose flies with black markings ; first posterior cell narrowly open or just closed, short hang-vein present ; antennae, palpi and legs black ; arista and eyes bare.

S. G. PLIONYCHIA End. 1936

conica Fall. 1811. **S.** Berrow (A.) 13/7/40, Walton Moor (F.) 12/6/49, Berrow (Cw.) 12/8/49.

S. F. HYPODERMATINAE

Ventral membrane present ; no sternopleural bristles ; hypopleural hairs in a bunch ; mouth organs absent ; large, hairy flies parasitic on Cattle (Warble Flies).

HYPODERMA Lat. 1818

lineatum Vill. 1789. **G.** Damery (A.) 7/6/30.

bovis L. 1761. **G.** Olveston (C.) 26/6/14 and 16/6/15, Painswick (W.).

Family :—**Calliphoridae**

Post-scutellum small or absent ; propleuron hairy (exc. POLLENIA) ; eyes bare ; arista more or less plumose ; colour metallic (exc. POLLENIA) ; no ventral membrane, abdominal sternites visible.

PROTOCALLIPHORA Hough 1899

Medium-sized, shining, metallic-cornflower-blue flies ; presutural acrostichal bristles strong, cheeks hairy ; palpi fulvous ; face, frons, antennae and legs black ; first posterior cell open ; parasitic on fledglings.

arurea Fall. 1816 (*caerulea* auctt. nec R.D.). **G.** and **S.** Fairly common.

PROTOPHORMIA Towns. 1908

Like PROTOCALLIPHORA, but presutural acrostichal bristles weak or absent; cheeks bare ; larvae saprophagous.

terrae-novae R.D. 1830 (*groenlandica* Zett. 1838). **G.** and **S.** Fairly common.

CYNOMYA R.D. 1830

Like PROTOCALLIPHORA, but frons, face, antennae and jowls bright orange; cheeks bare.

mortuorum L. 1761. **G.** Filton (F.) 7/10/46, Coombe Dingle (F.) 6/6/49. **S.** Priddy (F.) 8/8/35, Edington (Cw.) 12/10/48 and 14/6/49, Street Heath, Sharpham (Cw.) 23/4/49, Leigh Woods (F.) 14/5/50.

CALLIPHORA R.D. 1830

Like PROTOCALLIPHORA, but darker blue and more pruinose; cheeks bare; jowls rufous with black hairs (*erythrocephala*) or black with rufous hairs; larvae saprophagous (Blue Bottle Flies).

erythrocephala Mg. 1826. **G.** and **S.** Only too common, often in dwellings.

vomitoria L. 1758. **G.** and **S.** Common.

ONESIA R.D. 1830

Like PROTOCALLIPHORA, but smaller, darker, more pruinose; thoracic (lower) squama hairy, three sternopleural bristles; larvae parasitic on Earthworms.

aculeata Pand. 1896. **S.** Shepton Mallet (A.) 29/6/42.

agilis Mg. 1826. **G.** and **S.** Common.

biseta Villen. 1917. **S.** Clevedon (A.) 23/8/39 and 24/8/48.

MELINDA R.D. 1830

Like ONESIA, but thoracic squama bare and only two sternopleural bristles; has been bred from Snails.

gentilis R.D. 1830 (*anthracina* Mg. 1838). **S.** Clevedon (A.) 22/5/39 and 27/7/40, Loxley Wood, Shapwick (Cw.) 5/7/47.

caerulea Mg. 1826 (*cognata* Mg. 1830). **G.** and **S.** Fairly common.

LUCILIA R.D. 1830

Medium-sized, shining, metallic-green flies, with coppery reflections, pruinosity slight; second long vein setulose at least half-way to middle cross-vein; cheeks bare; antennae and legs black; palpi black or fulvous; larvae sarcophagous or coprophagous (Green Bottle Flies).

caesar L. 1758. **G.** and **S.** Very common.

ampullacea Villen. 1922 (*flavipennis* Kram. 1917 *preoc.*). **S.** Clevedon (A.) 30/5/39 and 20/5/47, Loxley Wood, Shapwick (Cw.) 21/9/48.

bufonivora Mon. 1876. **S.** Clevedon (A.) 28/5/44. Parasitic on *Bufo vulgaris* Laur.

illustris Mg. 1826. **G.** Filton (A.) 20/5/36, Bristol (A.) 12/7/47. **S.** Tickenham (A.) 19/9/24, Edington (Cw.) 23/9/48.

silvarum Mg. 1826. **G.** Shepperdine (A.) 10/8/24. **S.** Moreton (A.) 21/5/33, Shapwick (A.) 29/6/39, Edington (Cw.) 19/9/48.

richardsi Coll. 1926. **G.** Olveston (A.) 30/7/22. **S.** Rodney Stoke (A.) 6/4/29, Keynsham (A.) 1/6/36, Brockley Combe (A.) 31/8/33, Clevedon (A.) 17/7/40 and 17/8/42, Edington (Cw.) 18/9/48.

sericata Mg. 1826. **G.** Bristol (A.) 4/21. **S.** Clevedon (A.) 12/6/44, Edington (Cw.) 19/9/48. Larvae occur in wounds on Sheep and Goat.

POLLENIA R.D. 1830

Medium-sized, dark-coloured flies, easily recognised by the golden, fine hairs on thorax and pleura.

vespillo F. 1794. **G.** Cirencester (T.) 4/7/24, Bristol (A.) 9/19. **S.** Clevedon (A.) 17/10/41.

varia Mg. 1826. **G.** Olveston (A.) 14/9/29, Morton (F.) 14/7/47, Coombe Dingle (F.) 7/3/48, Bristol (F.) 27/6/48. **S.** Edington (F.) 19/6/48.

rudis F. 1794. **G.** and **S.** Very common, often in dwellings in winter (Cluster Fly).

excarinata Wain. 1940 (? *labialis* R.D. 1863). **G.** Bristol (A.) 7/12/24, Filton (F.) 27/5/48, Coombe Dingle (F.) 7/6/48. **S.** Tickenham (A.) 2/10/41, Barrow Gurney (F.) 27/6/48.

angustigena Wain. 1940. **S.** Backwell (A.) 13/5/34, Sharpham (A.) 17/4/34, Clevedon (A.) 23/8/39.

EGGISOPS Rond. 1862 (ENGYOPS B.B. 1889)

Small, black, slightly pruinose flies ; first posterior cell open ; antennae, palpi and legs black ; parasite on Snails.

pecchiolii Rond. 1862 (*macronyx* B.B. 1889). **G.** Durdham Down (F.) 9/7/46. **S.** Tickenham (A.) 23/6/29. Coxley, Wells (F.) 1/6/46, Edington (F.) 5/7/47, Clevedon (W.) 29/8/02.

S. F. RHINIINAE

STOMORHINA Rond. 1861 (IDIA Mg. 1826 *preoc.*)

Medium-sized fly with grey-pruinose thorax and rufous lateral spots on the abdomen in the male ; antennae, palpi and legs black ; probably an immigrant said to be parasitic on egg-capsules of Orthoptera.

lunata F. 1805 (*fasciata* Mg. 1826). **G.** Blaise Castle (F.) 25/8/45, Westbury-on-Trym (F.) 21–26/9/47 (31 specimens), Coombe Dingle (Lw.) 2/10/47. **S.** Edington (F.) 21/6/47.

Family :—**Muscidae** (*incl.* ANTHOMYIIDAE)

Hypopleural bristles absent ; third longitudinal vein either straight or gently curved upwards, first posterior cell always widely open ; vibrissae present ; larvae saprophagous or coprophagous.

S. F. MUSCINAE

Third longitudinal vein curved ; arista long-plumose.

MUSCA L. 1758

Curve on third longitudinal vein deep ; eyes bare ; colour not metallic.

domestica L. 1758. **G.** and **S.** Fairly common ; larvae in manure.

corvina F. 1781 (*autumnalis* auctt. *nec* Deg.). **G.** and **S.** Fairly common ; larvae coprophagous.

ORTHELLIA R.D. 1863 (CRYPTOLUCILIA B.B. 1893)

Like MUSCA, but colour metallic-blue-green ; larvae coprophagous.

caesarion Mg. 1826. **G.** and **S.** Fairly common.

cornicina F. 1781. **G.** and **S.** Common.

DASYPHORA R.D. 1830

Like ORTHELLIA, but curve of third longitudinal vein shallow and eyes hairy ; larvae saprophagous.

cyanella Mg. (*eriophthalma* Macq. 1835). **G.** and **S.** Common.

PYRELLIA R.D. 1830

LIKE DASYPHORA, but eyes bare.

cyanicolor Zett. 1845 (*serena* Stein *nec* Mg.). **G.** Kingsweston (A.) 6/4/33, Blaise Castle (A.) 24/4/25. **S.** Dunster (A.) 8/16, Clevedon (A.) 5/5/42.

serena Mg. 1826 (*aenea* Stein *nec* Zett.). **G.** Painswick (W.), Wotton-under-Edge (P.). **S.** Edington (F.) 20/6/48, Sharpham (F.) 6/9/47.

cadaverina L. 1758. **G.** Wotton-under-Edge (P.). **S.** Batheaston (Br.).

GRAPHOMYA R.D. 1830

Light-grey flies with characteristic black markings ; abdomen of male fulvous ; eyes hairy ; curve on third longitudinal vein deep.

maculata Scop. 1763. **G.** and **S.** Common.

var. *picta* Zett. 1855. **S.** Sharpham (A.) 20/8/25.

MYOSPILA Rond. 1856

Thorax grey-pruinose with black stripes, abdomen brownish with small, black spots ; eyes hairy ; curve on third vein shallow.

meditabunda F. 1781. **G.** and **S.** Common.

MUSCINA R.D. 1830 (CYRTONEURA Mg. 1838)

Black flies with grey markings ; tip of scutellum fulvous ; eyes bare ; acrostichal bristles strong.

stabulans Fall. 1823. **G.** and **S.** Common.

pabulorum Fall. 1823. **G.** Cirencester (T.) 2/8/23, Bristol (A.) 10/10/24, Downend (Bw.) 29/7/45, Durdham Down (F.) 9/3/47, Coombe Dingle (F.) 14/3/48, Filton (F.) 13/7/48. **S.** Leigh Woods (A.) 2/4/30, Clevedon (B.) 27/4/45.

assimilis Fall. 1823 (*caesia* Mg. 1826). **G.** Bristol (A.) 6/8/21, Durdham Down (F.) 21/3/48, Blaise Castle (F.) 25/4/48, Coombe Dingle (F.) 9/5/48, Filton (F.) 27/5/48. **S.** Clevedon (A.) 8/8/39, 23/7/41 and 16/9/44, Nailsea (Ma.) 24/7/45.

pascuorum Mg. 1826. **G.** Olveston (C.) 27/3/14, Coombe Dingle (F.) 3/7/45, Bristol (F.) 7/4/46, Filton (F.) 1/5/46. **S.** West Town (F.) 21/4/46.

MORELLIA R.D. 1830

Like MUSCINA, but scutellum not fulvous and acrostichal bristles weak.

aenescens R.D. 1830 (*curvipes* Macq. 1833). **G.** and **S.** Common.

hortorum Fall. 1816. **S.** Dunster (A.) 8/16, Tickenham (A.) 19/7/24, Long Ashton (A.) 2/6/34, Clevedon (A.) 17/5/40 and 25/7/43.

simplex Lw. 1857. **G.** and **S.** Fairly common.

S. F. STOMOXYDINAE

These are blood sucking flies so they have a long, hard, shiny proboscis.

STOMOXYS Geoff. 1762

Resembling a House-fly, but with black markings ; arista plumose on upper side only ; palpi shorter than the proboscis.

calcitrans L. 1758. **G.** and **S.** Common, especially in the autumn.

HAEMATOBIA Lep. and Serv. 1825

Like STOMOXYS, but smaller ; arista plumose on both sides and palpi as long as proboscis.

stimulans Mg. 1824. **G.** and **S.** Fairly common.

LYPEROSIA Rond. 1856

Like HAEMATOBIA, but much smaller and arista plumose only on upper side.

irritans L. 1761. **S.** Wrington (Wl.) 1/8/33.

S. F. GASTEROPHILINAE

Large, light-brown, somewhat hairy flies ; third longitudinal vein straight, and it and the fourth do not quite reach the edge of the wing ; dark blotches on the wing ; mouth organs absent ; arista bare ; apex of female abdomen bent under venter ; larvae in digestive tract of horses.

GASTEROPHILUS Leach 1817

intestinalis Deg. 1776 (*equi* Clark 1797). **G.** Painswick (W.), Wotton-under-Edge (P.), Hanham (Bw.) 11/9/43, Filton (F.) 20/9/48. **S.** Sharpham (A.) 28/8/23, Tickenham (A.) 19/9/20, Portishead (Bt.).

S. F. PHAONIINAE

Third longitudinal vein straight, anal vein not reaching the edge of the wing ; a dorsal bristle present on hind-tibia about two-thirds of the way down ; larvae coprophagous or zoophagous.

Tribe :—PHAONIINI

Usually three sternopleural bristles, if only two then arista is plumose.

DRYMEIA Mg. 1826

Medium-sized, blackish flies with a long geniculate proboscis.

hamata Fall. 1823. **G.** Painswick (W.) 2/7/92, Wotton-under-Edge (P.). **S.** Leigh Woods (H.), Shepton Mallet (Ch.) 19/6/25.

ACANTHIPTERA Rond. 1856

Yellow, narrow-bodied flies ; arista shortly plumose ; sub-costal vein setulose.

inanis Fall. 1825. **S.** Taunton (P.), Bridgwater (Sl.), St. Audries (A.) 28/8/29.

TRICHOPTICOIDES Ringdh. 1932 (Pogonomyia Rond. 1870 *p.p.*)

Medium-sized, dark flies with yellowish-grey pruinosity ; arista pubescent, eyes hairy.

decolor Fall. 1824. **G.** Cirencester (T.) 25/5/25, Blaise Castle (F.) 16/4/49.

ALLOEOSTYLUS Schnbl. 1888

Fairly large, wide-bodied, yellowish flies ; arista pubescent.

diaphanus Wied. 1817. **G.** Painswick (W.), Bristol (A.) 24/9/36, Blaise Castle (F.) 8/11/47, Chalford (F.) 6/9/48. **S.** Clevedon (W.) and (A.) 7/9/41, Leigh Woods (A.) 18/10/24 and 12/9/34, Blagdon (F.) 8/10/49, Failand (F.) 14/10/49.

simplex Wied. 1817. **G.** Coombe Dingle (F.) 9/11/47. **S.** Freshford (C.), Leigh Woods (H.).

LASIOPS Mg. 1838

Medium-sized, thorax black, grey-pruinose ; halteres and abdomen fulvous ; eyes pubescent ; arista practically bare ; no costal spine.

semicinereus Wied. 1817. **G.** Painswick (W.) 23/7/91, Coombe Dingle (F.) 28/5/49. **S.** Leigh Woods (A.) 22/6/25, Moreton (A.) 23/6/34, Weston-s-Mare (J.) 15/5/23, Freshford (A.) 5/6/37, Keynsham (A.) 1/6/29, Clevedon (A.) 8/7/40, Cadbury Camp (F.) 11/5/47.

DIALYTA Mg. 1826

Like Lasiops, but all black ; eyes bare ; costal spine present.

atriceps Lw. 1858. **G.** Coombe Dingle (F.) 9/6/46 and 19/5/47. **S.** Street Heath, Sharpham (F.) 22/5/49.

halterata Stein 1893. **G.** Coombe Dingle (F.) 11/6/46 and 2/7/49. **S.** Street Heath, Sharpham (F.) 22/5/49, Walton Moor (F.) 29/5/49, Leigh Woods (F.) 5/6/49.

LOPHOSCELES Ringdh. 1922 (Trichopticus Rond. 1861)

Like Dialyta, but costal spine absent and halteres yellow.

cristatus Zett. 1845 (*pulcher* Mde. 1882). **G.** Cirencester (T.) 16/6/24, Shepperdine (A.) 30/7/24, Blaise Castle (F.) 29/9/46. **S.** Shepton Mallet (C.).

mutatus Fall. 1823 (*semipellucidus* Zett. 1845). **G.** Cirencester (T.).

POLIETES Rond. 1866

Fairly large, black flies with five grey-pruinose stripes on the thorax ; eyes hairy ; arista long-plumose ; halteres brown-black ; larvae zoophagous.

lardaria F. 1781. **G.** and **S.** Common.

PSEUDOMORELLIA Ringdh. 1929 (Polietes Rond. 1866 *p.p.*)

Like Polietes, but smaller and only three grey-pruinose stripes on the thorax ; halteres fulvous.

albolineata Fall. 1823. **G.** and **S.** Common.

PHAONIA R.D. 1830 (Yetodesia Rond. 1861, *emend.* Hyetodesia Mde. 1881)

Fairly large flies which conform to the characters of the sub-family and have none of the special characters of the foregoing genera ; larvae zoophagous.

palpata Stein 1897 (*trigonalis* Mde. 1887). **G.** Blaise Castle (A.) 28/5/27 and (F.) 18/10/47, Filton (F.) 23/5/46, Durdham Down (F.) 2/6/46, Coombe Dingle (F.) 2/5/48. **S.** Leigh Woods (H.) 19/5/19 and (A.) 31/9/27, Brockley Combe (H.) 28/9/20, Clevedon (A.) 14/5/27, Portishead (F.) 24/5/47, Failand (F.) 1/11/47.

magnicornis Zett. 1845. **G.** Durdham Down (F.) 11/6/47. **S.** Sharpham (F.) 6/9/47.

mystica Mg. 1826. **S.** Taunton (P.), Clevedon (A.) 17/7/41.

vittifera Zett. 1845. **G.** Coombe Dingle (F.) 9/5/46, Blaise Castle (F.) 25/4/48. **S.** West Town (F.) 25/5/47.

scutellaris Fall. 1825. **G.** Painswick (W.), Kingsweston (A.) 31/5/25, Coombe Dingle (F.) 4/10/47, Blaise Castle (F.) 5/7/48, Mangotsfield (Bw.) 9/9/45. **S.** Leigh Woods (H.), Keynsham (C.) and (A.) 5/5/35, Clevedon (A.) 14/5/27, West Town (F.) 17/5/47, Cadbury Camp (F.) 12/7/47.

var. *stolata* Rond. 1866. **S.** Leigh Woods (A.) 18/10/24.

variegata Mg. 1826. **G.** and **S.** Common.

pallida F. 1787. **G.** and **S.** Fairly common.

bitincta Rond. 1866. **G.** Bristol (Bw.) 10/4/45.

goberti Mik 1881. **G.** Bristol (F.) 24/4/46, Coombe Dingle (F.) 26/10/47 and 9/5/48, Blaise Castle (F.) 25/4/48, Filton (F.) 3/5/48. **S.** Leigh Woods (H.) and (F.) 17/6/45, Shapwick (F.) 7/7/45, West Town (F.) 25/5/47.

trimaculata Bché. 1834. **G.** Filton (F.) 22/5/46 and 9/7/48, Coombe Dingle (F.) 25/5/46 and 23/7/49. **S.** Walton Moor (F.) 19/4/49, Loxley Wood, Shapwick (F.) 24/4/49.

laeta Fall. 1823. **G.** Bully (W.), Wotton-under-Edge (P.), Blaise Castle (F.) 24/7/49.

rufipalpis Macq. 1835. **G.** Olveston (C.) 10/3/14, Cirencester (T.), Blaise Castle (F.) 3/9/49. **S.** Leigh Woods (H.) 3/7/18, Pensford (H.) 20/6/19, Sharpham (A.) 4/8/25, Clevedon (A.) 17/6/42.

perdita Mg. 1830. **G.** Filton (A.) 22/5/30, 18/4/35 and (F.) 7/7/49, Coombe Dingle (F.) 14/5/49. **S.** Leigh Woods (H.), Easton-in-Gordano (F.) 10/9/49.

vagans Fall. 1825. **G.** Coombe Dingle (F.) 13/6/46, Filton (F.) 23/7/46. **S.** Taunton (A.) 6/6/31, Failand (F.) 29/7/45.

basalis Zett. 1838. **G.** and **S.** Fairly common.

signata Mg. 1826. **G.** and **S.** Fairly common.

erratica Fall. 1825. **G.** and **S.** Fairly common.

errans Mg. 1826. **G.** and **S.** Fairly common.

tinctipennis Rond. 1877. **S.** Sharpham (A.) 20/8/25.

serva Mg. 1826. **G.** and **S.** Fairly common.

cincta Zett. 1846. **S.** Barrow Gurney (F.) 27/6/48.

incana Wied. 1817. **G.** Painswick (W.), Cirencester (T.) 1/7/24, Sheepscombe (St.) 18/6/27, Morton (F.) 14/7/47. **S.** Sharpham (A.) 28/4/24, Chew Magna (A.) 30/5/31, Priddy (A.) 6/6/37, Shepton Mallet (A.) 29/6/42, Edington (F.) 5/7/47.

canescens Stein 1916. **G.** Coombe Dingle (F.) 7/6/48. First British record.

querceti Bché. 1834. S. G. DENDROPHAONIA Mall. 1922. **G.** Avon Gorge (F.) 1/8/37.

Tribe :—HYDROTAEINI

Always two sternopleural bristles ; larvae coprophagous or zoophagous.

OPHYRA R.D. 1830

Medium-sized, shining, blue-black flies ; front-femora normal ; hind-tibiae hairy ; eyes bare ; arista pubescent.

leucostoma Wied. 1817. **G.** and **S.** Fairly common ; lunula silvery.

anthrax Mg. 1826. **G.** Wotton-under-Edge (P.).

HYDROTAEA R.D. 1830

Medium-sized, dark-pruinose flies ; fore-femora, and often fore-tibiae, with incisions and teeth ; some species often settle on man or animals to absorb perspiration, but they are not blood-suckers.

occulta Mg. 1826. **G.** Cirencester (T.) 22/5/23, Bristol (F.) 12/4/48, Blaise Castle (F.) 25/4/48.

bimaculata Mg. 1826 (*ciliata* F. 1794 preoc.). **G.** and **S.** Fairly common.

cyrtoneurina Zett. 1845. **G.** Olveston (A.) 30/7/22, Blaise Castle (F.) 25/4/48, Coombe Dingle (F.) 2/5/48. **S.** Priddy (F.) 15/8/45.

albipuncta Zett. 1845. **G.** Painswick (W.) 23/9/24, Cirencester (T.) 3/6/23. **S.** Keynsham (A.) 1/6/29, Clevedon (A.) 17/6/42 and 26/8/44, Cadbury Camp (F.) 12/5/46 and 11/5/47, Coxley, Wells (F.) 1/6/46.

armipes Fall. 1825. **G.** Olveston (A.) 13/6/28, Filton (F.) 2/7/48. **S.** West Town (F.) 17/5/47.

irritans Fall. 1823. **G.** and **S.** Very common.

similis Mde. 1887. **G.** Mangotsfield (Bw.) 11/4/45, Blaise Castle (F.) 22/5/45, Bristol (F.) 12/4/46, Coombe Dingle (F.) 25/5/46. **S.** Clevedon (A.) 18/6/40 and (F.) 28/5/47, West Town (F.) 21/4/46.

palaestrica Mg. 1826. **G.** Sheepscombe (St.) 18/6/29, Bristol (F.) 7/10/44, Blaise Castle (F.) 15/4/45, Filton (F.) 10/5/45, Coombe Dingle (F.) 3/5/47. **S.** Berrow (A.) 27/8/24.

dentipes F. 1805. **G.** and **S.** Common.

militaris Mg. 1826. **G.** Filton (F.) 16/5/45, Coombe Dingle (F.) 19/7/47 and 30/5/48, Blaise Castle (F.) 22/5/45, Kingsweston (F.) 9/6/46. **S.** Freshford (A.) 5/6/37 and 28/5/38, Clevedon (A.) 27/8/42, Coxley, Wells (F.) 1/6/46.

tuberculata Rond. 1866. **G.** Pilning (A.) 12/5/35, Coombe Dingle (F.) 29/5/46.

pilipes Stein 1903. **G.** Chalford (F.) 15/7/47.

parva Mde. 1889. **G.** Filton (F.) 27/7/49. **S.** Portbury (F.) 7/8/37, Sharpham (F.) 28/8/48.

penicillata Rond. 1866. **S.** Clevedon (W.) 19/8/01.

velutina R.D. 1830. **G.** Bristol (F.) 22/5/46, Coombe Dingle (F.) 20/5/47.

meteorica L. 1758. **G.** Cirencester (T.) 20/5/23, Filton (F.) 28/5/46, Coombe Dingle (F.) 8/5/48. **S.** Tickenham (A.) 20/5/31 and 26/4/36, St. Audries (A.) 24/8/29, Clevedon (A.) 18/5/39, Cadbury Camp (F.) 15/5/46.

Tribe :—FANNIINI

In male the mid-tibiae are abnormally shaped or at least bear a dense pubescence on the inner side ; in female the orbits are broad and bear strong bristles turned outwards over the eyes ; two sternopleural bristles ; eyes usually bare ; arista pubescent or bare, *exc.* PIEZURA.

FANNIA R.D. 1830 (HOMALOMYIA Bché. 1834)

The last vein (Ax.) longer than the previous one (An.) and curved upwards.

hamata Macq. 1835. **G.** and **S.** Fairly common.

ornata Mg. 1826. **G.** Coombe Dingle (F.) 2/5/48. **S.** West Town (F.) 1/6/47.

pretiosa Schin. 1862. **G.** Olveston (A.) 1/9/23. **S.** Saltford (F.) 1/9/46.

fuscula Fall. 1825. **G.** and **S.** Fairly common.

vesparia Mde. 1891. **S.** Saltford (F.) 1/9/46.

pallitibia Rond. 1866. **G.** Stone (A.) 28/7/28, Blaise Castle (A.) 6/9/30 and (F.) 2/10/48, Durdham Down (F.) 15/9/46, Coombe Dingle (F.) 26/10/47. **S.** Banwell (A.) 20/10/28, Clevedon (A.) 30/9/39 and 9/9/40.

speciosa Villen. 1898. **G.** Filton (F.) 24/5/46.

canicularis L. 1761. **G.** and **S.** Very common, often in dwellings.

difficilis Stein 1895. **G.** Bristol (F.) 1/5/46.

hirticeps Stein 1892. **G.** Coombe Dingle (F.) 19/5/47.

aerea Mg. 1826. **G.** Cirencester (T.), Thornbury (F.) 22/4/48, Blaise Castle (F.) 25/4/48, Coombe Dingle (F.) 9/5/48. **S.** Keynsham (A.) 24/5/36, Holford (F.) 12/6/48.

umbrosa Stein 1895. **G.** Filton (F.) 3/6/46, Durdham Down (F.) 7/9/46.

armata Mg. 1826. **G.** Painswick (W.) 6/6/01, Cirencester (T.), Olveston (A.) 18/6/22, Hallen (A.) 27/6/26, Filton (F.) 12/7/47. **S.** Taunton (P.), Sharpham (A.) 7/9/35, Shepton Mallet (A.) 24/6/42.

scalaris F. 1794. **G.** and **S.** Common.

monilis Hal. 1838. **G.** Filton (F.) 10/5/46 and 19/9/46.

manicata Mg. 1826. **G.** Cirencester (T.), Hallen (A.) 24/9/27, Bristol (F.) 19/4/48, Thornbury (F.) 22/4/48, Blaise Castle (F.) 25/4/48. **S.** Clevedon (A.) 30/5/39, 13/7/40 and 24/4/44, West Town (F.) 21/4/46.

lineata Stein 1895. **G.** Bristol (F.) 20/5/46, Filton (F.) 3/6/46, Coombe Dingle (F.) 30/6/46. **S.** Coxley, Wells (F.) 1/6/46.

incisurata Zett. 1838. **G.** Painswick (W.), Wotton-under-Edge (P.), Olveston (A.) 14/9/29, Littledean (A.) 25/5/31, Durdham Down (F.) 6/5/47, Thornbury (S. Green) 4/9/49. **S.** Tickenham (A.) 2/6/25, Edington (F.) 24/4/49.

pubescens Stein 1913. **G.** Filton (F.) 20/9/46. **S.** Clevedon (F.) 12/7/47.

sociella Zett. 1845. **G.** and **S.** Fairly common.

kowarzi Verr. 1892. **G.** Coombe Dingle (F.) 9/6/46.

carbonaria Mg. 1826. **G.** Filton (F.) 29/4/49. **S.** Leigh Woods (F.) 11/6/49.

postica Stein 1895. **G.** Coombe Dingle (F.) 11/5/46 and 15/6/46, Blaise Castle (F.) 25/4/48.

polychaeta Stein 1895. **S.** Clevedon (A.) 17/7/41.

parva Stein 1895. **G.** Coombe Dingle (F.) 19/5/46, Durdham Down (F.) 18/6/46, Blaise Castle (F.) 8/11/47.

serena Fall. 1825. **G.** and **S.** Fairly common.

similis Stein 1895. **G.** Durdham Down (F.) 30/5/47, Coombe Dingle (F.) 2/5/48, Bristol (F.) 5/6/48. **S.** West Town (F.) 1/6/49.

atra Stein 1895. **S.** Clevedon (F.) 12/7/47.

genualis Stein 1895. **G.** Painswick (W.) 8/7/91, Filton (F.) 29/4/49. **S.** Cadbury Camp (F.) 11/5/47, Sharpham (F.) 19/6/49.

coracina Lw. 1873. **G.** Painswick (W.), Cirencester (T.) 11/7/24, Blaise Castle (A.) 9/21. **S.** Backwell (A.) 17/7/26.

mutica Zett. 1845. **G.** Painswick (W.), Shepperdine (A.) 30/7/24, Filton (F.) 28/5/46, Coombe Dingle (F.) 21/9/46, Durdham Down (F.) 11/6/47. **S.** Sharpham (A.) 7/9/25, Shapwick (A.) 7/9/30, Keynsham (A.) 1/6/36.

COELOMYIA Hal. 1840 *nec* 1845

Small, dark fly with abdomen narrower at base than in the middle ; mouth protruding.

mollissima Hal. 1840 (*spathulata* Zett. 1845). **G.** Cirencester (T.) 21/4/23, Dursley (A.) 24/4/30, Blaise Castle (A.) 11/4/27 and (F.) 26/4/47, Durdham Down (F.) 3/5/47, Coombe Dingle (F.) 8/5/47. **S.** Leigh Woods (A.) 7/5/22, Ham Green (F.) 26/4/47.

PIEZURA Rond. 1866

Medium-sized flies with grey-pruinose thorax and fulvous abdomen ; arista plumose.

pardalina Rond. 1866. **G.** Coombe Dingle (F.) 2/8/24, Blaise Castle (F.) 29/9/46 and 3/9/49. **S.** Ham Green (F.) 23/6/46, Leigh Woods (F.) 20/7/47.

S. F. LISPINAE

No dorsal bristle on hind-tibiae ; palpi spathulate ; pteropleuron with a brush of hairs ; arista plumose ; abdomen with grey and black markings ; flies predaceous, found near water ; larvae aquatic and zoophagous.

LISPE Lat. 1796 (LISPA Fall. 1810)

caesia Mg. 1826 (*crassiuscula* Lw. 1847). **G.** Shepperdine (A.) 6/8/24. **S.** Burnham (A.) 25/8/22, Berrow (Cw.) and (F.) 27/8/49, Easton-in-Gordano (F.) 4/9/49.

litorea Fall. 1825. **G.** New Passage (F.) 11/8/45. **S.** Long Ashton (Bw.) 10/9/45, Easton-in-Gordano (F.) 4/9/49.

tentaculata Deg. 1776. **G.** Olveston (A.) 31/8/33, New Passage (F.) 11/8/45, Coombe Dingle (F.) 28/5/49. **S.** Shepton Mallet (C.), Burnham (A.) 25/8/22, Clevedon (A.) 29/7/47, Edington (F.) 24/4/49.

uliginosa Fall. 1825. **G.** Bristol (F.) 8/8/35. **S.** Sharpham (A.) 11/8/25.

nana Macq. 1835. **S.** Clevedon (A.) 17/8/40.

S. F. Mydaeinae

Anal vein does not reach the edge of the wing ; no dorsal bristle on hind-tibia.

Tribe :—Azelini

Eyes bare ; arista pubescent ; abdomen with circular black spots ; hind-tibia with characteristic bristles ; axillary (last) vein turned up.

AZELIA R.D. 1830

cilipes Hal. 1838. **G.** Queenhill, Tewkesbury (A.) 6/11/25, Coombe Dingle (F.) 1/5/49. **S.** Sharpham (A.) 6/9/25, Tickenham (A.) 12/5/29, Clevedon (A.) 25/9/39.

macquarti Staeg. 1843. **G.** and **S.** Fairly common.

gibbera Mg. 1826. **S.** Portbury (F.) 4/8/37.

zetterstedti Rond. 1866. **G.** Shepperdine (A.) 2/8/24, Coombe Dingle (F.) 7/9/46, Durdham Down (F.) 24/9/47.

aterrima Mg. 1826. **S.** Sharpham (A.) 7/9/25.

triquetra Wied. 1817. **G.** Tortworth (A.) 27/4/27, Coombe Dingle (F.) 7/9/46. **S.** Nailsea (A.) 21/4/27.

Tribe :—Limnophorini

Medium-sized flies ; eyes bare ; acrostichal bristles present ; axillary vein straight ; abdomen with black spots on a grey ground ; found near water ; larvae aquatic and zoophagous.

LIMNOPHORA R.D. 1880

S. G. Spilogona Schnbl. 1911

kuntzei Schnbl. 1911 (*curata* Coll. 1921, *triangulifera* Mde. 1897 *nec* Zett. 1838). **S.** Easton-in-Gordano (F.) 10/9/49.

surda Zett. 1845. **G.** Coombe Dingle (F.) 7/6/47. **S.** Sharpham (F.) 22/5/49.

denigrata Mg. 1826. **G.** Sheepscombe (St.) 18/6/27. **S.** Holford (A.) 28/8/29, St. Audries (A.) 30/8/29.

vana Zett. 1845. **G.** Filton (F.) 26/3/46, Blaise Castle (F.) 26/3/48, Coombe Dingle (F.) 19/4/48. **S.** Leigh Woods (F.) 11/6/49.

aerea Fall. 1825. **S.** Berrow (A.) 26/6/39, Easton-in-Gordano (F.) 10/9/49.

veterrima Zett. 1845. **S.** Berrow (A.) 13/7/30.

S. G. Gymnodia R.D. 1863

humilis Zett. 1860. **G.** Filton (F.) 26/6/47. **S.** Sharpham (A.) 6/8/23.

S. G. Pseudolimnophora Strobl 1893

triangula Fall. 1825. **G.** Coombe Dingle (F.) 20/5/47 and 3/7/48, Hallen (F.) 18/9/47. **S.** Tickenham (A.) 11/5/29, Moreton (A.) 20/7/33, Leigh Woods (F.) 20/9/47.

nigripes R.D. 1830. **G.** Coombe Dingle (F.) 21/9/46.

S. G. Limnophora *s.str.* (Calliophrys Kow. 1893)

notata Fall. 1823. **G.** Coombe Dingle (F.) 28/5/49 and 3/9/49. **S.** Sharpham (F.) 28/8/48.

maculosa Mg. 1826. **G.** Coombe Dingle (F.) 30/5/48. **S.** Walton Moor (F.) 24/8/47.

setinerva Schnbl. 1911 (*exsurda* Stein *nec* Pand). **G.** Aust (A.) 6/9/23. **S.** Tickenham (A.) 24/5/26, St. Audries (A.) 19/8/29, Clevedon (A.) 22/7/41.

scrupulosa Zett. 1845. **G.** Coombe Dingle (F.) 22/4/46.

riparia Fall. 1824. **G.** Littledean (A.) 25/5/31, Coombe Dingle (F.) 18/7/47 and 16/10/49. **S.** Tickenham (A.) 1/7/33, Shepton Mallet (A.) 7/7/42.

exuta Kow. 1893. **S.** Tickenham (A.) 1/7/33, Clevedon (A.) 19/10/40, Saltford (F.) 1/9/46.

Tribe :—Mydaeini

No acrostichal bristles ; abdomen usually yellowish-brown pruinose, unspotted or spotted, or black, unspotted ; axillary vein straight ; eyes hairy or bare ; larvae saprophagous or zoophagous.

HEBECNEMA Schnbl. 1889

Black flies with unspotted abdomen ; arista plumose.

fumosa Mg. 1826. **G.** Westbury-on-Trym (F.) 14/10/44, Bristol (F.) 15/4/46. **S.** Sharpham (A.) 19/4/29.

umbratica Mg. 1826. **G.** and **S.** Fairly common.

nigricolor Fall. 1825. **G.** Blaise Castle (Wm.) 12/5/20, Queenhill, Tewkesbury (A.) 1/11/25, Kingsweston (F.) 11/6/46, Coombe Dingle (F.) 14/6/47. **S.** Banwell (Ch.) 31/5/25, Loxley Wood, Shapwick (A.) 5/7/47, Cadbury Camp (F.) 12/7/47.

affinis Mall. 1920. **G.** and **S.** Very common.

vespertina Fall. 1823. **G.** Filton (F.) 10/5/46, Durdham Down (F.) 15/9/46, Coombe Dingle (F.) 29/2/48, 6/6/49 and 16/10/49. Blaise Castle (F.) 21/3/48. **S.** Easton-in-Gordano (F.) 4/9/49.

MYDEA R.D. 1830

A few bristles present at the base of the second longitudinal vein ; fairly large flies, usually light coloured with unspotted abdomen ; eyes usually bare ; arista plumose or pubescent.

scutellaris R.D. 1830 (*pagana* F. 1794 *preoc.*). **G.** Wotton-under-Edge (P.), Cirencester (T.), Olveston (C.) 8/17, Hanham (A.) 19/6/22, Kingsweston (F.) 11/6/46, Coombe Dingle (F.) 4/10/47, Blaise Castle (F.) 18/10/47. **S.** Keynsham (A.) 1/6/29, Loxley Wood, Shapwick (A.) 5/7/47.

tincta Zett. 1845. **G.** Cirencester (T.) 16/6/24, Blaise Castle (F.) 12/10/47 and 3/9/49. **S.** Nailsea (A.) 28/6/39, Failand (F.) 24/7/49.

urbana Mg. 1826. **G.** Wotton-under-Edge (P.), Cirencester (T.). **S.** Leigh Woods (A.) 29/9/24, Chewstoke (A.) 8/7/32, Sharpham (St.) 4/6/27.

nebulosa Stein 1893. **G.** Coombe Dingle (F.) 2/5/46 and 26/6/47. **S.** Walton Moor (F.) 7/5/49.

ancilla Mg. 1826. **G.** Bristol (F.) 9/5/46, Coombe Dingle (F.) 28/5/49.

ENOPLOPTERYX Hend. 1902

Eyes bare, arista plumose ; costa spinulose ; abdomen spotted.

obtusipennis Fall. 1823. **G.** Durdham Down (F.) 30/7/47, Filton (F.) 24/5/49. **S.** West Town (F.) 17/5/47, Failand (F.) 31/5/47.

ciliatocosta Zett. 1845. **G.** Filton (F.) 23/8/46 and 19/8/48.

HELINA R.D. 1830 (Spilogaster Macq. 1835)

Like Mydaea, but no bristles on second vein and abdomen usually spotted.

atripes Mde. 1889. **G.** Painswick (W.) Cirencester (T.), Kingsweston (A.) 8/7/25, Coombe Dingle (F.) 3/7/45, Filton (F.) 23/7/46. **S.** Charterhouse-on-Mendip (A.) 20/6/23, Clevedon (F.) 12/7/47.

communis R.D. 1830 (*setiventris* Ringdh. 1924, *duplaris* Stein *nec* Zett.). **G.** Wotton-under-Edge (P.), Cirencester (T.), Olveston (A.) 18/6/22, Durdham Down (F.) 1/7/46, Filton (F.) 16/7/48. **S.** Leigh Woods (A.) 22/5/27, Berrow (A.) 13/7/30, Clevedon (A.) 22/7/40 and 16/5/43, Edington (F.) 19/6/48.

duplicata Mg. 1826. **G.** Blaise Castle (A.) 7/9/29, Filton (F.) 5/5/48. **S.** Clevedon (A.) 28/4/45, Holford (F.) 12/6/48.

lucorum Fall. 1823. **G.** and **S.** Common.

annosa Zett. 1838 (*multisetosa* Strobl 1897). **S.** Kenn Moor (A.) 16/6/39.

obscurata Mg. 1826. **S.** Tickenham (A.) 12/6/29 and 9/5/36, Kenn Moor (A.) 27/6/39.

marmorata Zett. 1860. **S.** Leigh Woods (H.) 19/6/19.

quadrimaculata Fall. 1823. **G.** Cirencester (T.) 17/6/24, Tortworth (A.) 27/4/27, Filton (F.) 23/5/46, Durdham Down (F.) 2/6/46, Coombe Dingle (F.) 2/5/48, Blaise Castle (F.) 9/5/48. **S.** West Town (F.) 25/5/47, Loxley Wood, Shapwick (F.) 5/7/47, Edington (F.) 19/6/48.

latitarsis Ringdh. 1924 (*nivalis* Stein *nec* Zett.). **S.** Keynsham (A.) 19/7/26, Coxley, Wells (F.) 1/6/46.

lasiophthalma Macq. 1835. **G.** Cirencester (T.) 26/5/24, Filton (F.) 19/9/46 and 10/6/49. **S.** Clevedon (W.) 29/8/02.

impuncta Fall. 1825. **G.** and **S.** Fairly common.

denudata Zett. 1845. **G.** Durdham Down (F.) 22/5/46.

pertusa Mg. 1826. **G.** Hallen (A.) 14/9/25, Coombe Dingle (F.) 4/10/47, Blaise Castle (F.) 14/5/49.

concolor Cz. 1901. **S.** Clevedon (A.) 9/9/40.

flagripes Rond. 1866. **G.** Painswick (St.) 26/7/22.

abdominalis Zett. 1846. **G.** Wotton-under-Edge (P.).

quadrum F. 1805. **G.** Painswick (W.) 18/6/91, Cirencester (T.) 2/7/24, Olveston (Wm.) 13/6/28, Durdham Down (F.) 21/7/46, Coombe Dingle (F.) 2/5/48, Filton (F.) 18/6/48. **S.** Clevedon (A.) 2/7/40 and 11/8/41.

calceata Rond. 1866. **G.** Shepperdine (A.) 13/8/24. **S.** Berrow (A.) 22/8/28, Winford Down (F.) 8/10/49.

depuncta Fall. 1825. **G.** Painswick (St.) 19/6/24, Kingsweston (A.) 8/7/29 and (F.) 9/6/45, Coombe Dingle (F.) 26/10/47, Filton (F.) 11/6/48. **S.** Weston-s-Mare (H.) 25/5/20, Ashcott (H.) 28/9/20, Tickenham (A.) 8/20, Clevedon (A.) 24/6/44.

protuberans Zett. 1845. **S.** Berrow (A.) 6/21, Burnham (A.) 25/8/22.

consimilis Fall. 1825. **G.** Filton (A.) 1/6/32 and (F.) 24/5/46. **S.** Backwell (A.) 2/5/28.

fratercula Zett. 1845. **S.** Leigh Woods (F.) 7/6/49.

uliginosa Fall. 1825. **G.** Filton (F.) 30/5/46, Bristol (F.) 28/9/49.

maculipennis Zett. 1845. **S.** Walton Moor (F.) 19/4/49.

S. F. FUCELLIINAE

Anal vein reaches the edge of the wing, two pairs of presutural dorso-central bristles ; eyes far apart in both sexes ; squamae small ; larvae phytophagous or zoophagous.

MYCOPHAGA Rond. 1856

Arista plumose ; abdomen fulvous ; larvae in fungi but are zoophagous.

fungorum Deg. 1776. **G.** Cirencester (T.) 4/6/23, Blaise Castle (F.) 14/5/49. **S.** Taunton (P.), Clevedon (A.) 25/9/40, Leigh Woods (F.) 11/6/49.

FUCELLIA R.D. 1842

Medium-sized, dark flies ; jowls broad ; arista bare ; larvae in Seaweed.

fucorum Fall. 1819. **S.** Burnham (A.) 28/8/22.

maritima Hal. 1838. **G.** Aust (A.) 6/9/23. **S.** Burnham (A.) 28/8/22, Dunster (A.) 8/6/24, Berrow (A.) 27/8/24.

CHIROSIA Rond. 1856

Small, black flies ; arista pubescent ; jowls narrow ; found on *Pteris aquilina* L. (Bracken Fern) in which the larvae are parasitic.

albitarsis Zett. 1845. **G.** Filton (A.) 22/5/30. **S.** Clevedon (A.) 27/7/45, Sharpham (F.) 21/5/49.

crassiseta Stein 1908. **S.** Leigh Woods (F.) 5/6/49.

S. F. ANTHOMYIINAE

Like FUCELLIINAE, but eyes of male close together and squamae large; larvae phytophagous, coprophagous or saprophagous.

EUSTALOMYIA Kow. 1873

Light-grey flies with characteristic black markings; eyes bare; arista pubescent or plumose; larvae cleptoparasites in nests of Solitary Wasps.

histrio Zett. 1838. **G.** Cirencester (T.) 28/6/22, Hallen (A.) 19/6/26, Filton (F.) 23/7/46, Coombe Dingle (F.) 13/6/48, Blaise Castle (F.) 3/7/48. **S.** Leigh Woods (H.) and (F.) 17/6/45, Chewstoke (A.) 23/6/34, Ham Green (F.) 23/6/46, Barrow Gurney (F.) 27/6/48.

festiva Zett. 1845. **G.** Painswick (W.) 5/93. **S.** Sharpham (A.) 4/8/25.

vittipes Zett. 1845. **G.** Moorend (Bw.) 15/9/45. **S.** Tickenham (Bw.) 10/9/45.

HYDROPHORIA R.D. 1830

Moderately large, dark-brown flies; eyes bare; arista plumose; thorax striped, the inner stripes narrower than the outer; legs partly fulvous; squamae unequal in size; larvae saprophagous.

linogrisea Mg. 1826. **G.** Bristol (A.) 8/6/32, Mangotsfield (Bw.) 28/4/45, Coombe Dingle (F.) 19/7/47. **S.** Leigh Woods (F.) 20/9/47.

annulata Pand. 1899. **S.** Leigh Woods (F.) 5/6/49.

conica Wied. 1817. **G.** and **S.** Fairly common.

ruralis Mg. 1826. **G.** Coombe Dingle (F.) 18/7/47, Filton (F.) 26/8/47. **S.** Sharpham (A.) 4/9/25, Chewstoke (A.) 8/7/32, Clevedon (A.) 26/7/40, Tickenham (A.) 23/7/41, Shapwick (F.) 14/4/46, Leigh Woods (F.) 20/7/47, Walton Moor (F.) 24/8/47.

ACROPTENA Pok. 1893

Like HYDROPHORIA but darker, and thorax with three equally wide stripes; arista pubescent or plumose; legs black.

villosa Ringd. 1918. **S.** Clevedon (F.) 28/5/47.

divisa Mg. 1826. **G.** Blaise Castle (F.) 22/5/45, Filton (F.) 28/8/47, Coombe Dingle (F.) 13/7/47. **S.** Tickenham (A.) 11/7/31, Coxley, Wells (F.) 4/8/45, Shapwick (F.) 14/4/46, Clevedon (F.) 28/5/47.

ambigua Fall. 1823. **G.** Coombe Dingle (F.) 27/7/49. **S.** Walton Moor (F.) 12/6/49.

PEGOMYA R.D. 1830 (*emend.* PEGOMYIA Macq. 1835)

Medium to small flies, usually dark, sometimes wholly or partly fulvous; eyes bare; thorax unstriped; squamae equal in size; larvae saprophagous or parasitic on flowering plants or Fungi.

S. G. PEGOPLATA Schnbl. and Dz. 1911

Dark, medium-sized flies; arista plumose; legs black, at most knees fulvous.

virginea Mg. 1826. **G.** Durdham Down (F.) 2/6/46, Coombe Dingle (F.) 7/6/47. **S.** Clevedon (A.) 19/9/42, Ham Green (F.) 23/6/46, West Town (F.) 28/6/47, Loxley Wood, Shapwick (F.) 20/6/48.

S. G. PEGOMYZA Schnbl. and Dz. 1911

Like PEGOPLATA, but at least the tibiae fulvous.

intermedia Mg. 1826 (*schineri* Schnbl. and Dz. 1911). **G.** Coombe Dingle (F.) 8/5/45, Chalford (F.) 15/7/47. **S.** West Town (F.) 1/6/47.

praepotens Wied. 1817. **G.** Durdham Down (F.) 23/7/46.

S. G. PEGOMYA *s.str.*

Body dark or more or less fulvous; legs mainly fulvous; arista bare or shortly pubescent; larvae mainly parasitic in plants.

silacea Mg. 1830. **G.** Wotton-under-Edge (P.).

transversa Fall. 1825. **G.** Painswick (W.) 22/7/92, Thornbury (S. Green) 11/9/49, Bristol (F.) 25/8/49. Larvae in Fungi.

winthemi Mg. 1826. **G.** Painswick (W.) 22/7/92, Olveston (A.) 15/7/22. **S.** Sharpham (A.) 18/8/25, Clevedon (A.) 8/8/39. In Fungi.

ulmaria Rond. 1865. **G.** Aust (F.) 8/5/49. **S.** Taunton (P.).

bicolor Wied. 1817. **G.** and **S.** Common. In *Rumex* spp. and *Polygonum* spp.

flavipes Fall. 1825. **S.** Leigh Woods (H.) 26/6/16, Sharpham (A.) 8/20, Clevedon (A.) 9/9/40.

univittata v.Ros. 1840. **G.** Coombe Dingle (F.) 10/6/47 and 19/7/47, Blaise Castle (F.) 18/10/47. **S.** Leigh Woods (H.) 16/6/19, Backwell (A.) 17/7/26, Clevedon (A.) 25/9/39 and 2/7/40, Ham Green (F.) 23/6/46, Cadbury Camp (F.) 12/7/47.

iniqua Stein 1906. **G.** Shepperdine (A.) 22/8/24, Olveston (A.) 15/8/22. In *Agaricus* spp.

geniculata Bché. 1834. **G.** Durdham Down (F.) 2/6/47, Coombe Dingle (F.) 13/6/48. **S.** West Town (F.) 1/6/47. In Fungi.

vittigera Zett. 1838. **G.** Coombe Dingle (F.) 10/6/47. **S.** Clevedon (A.) 22/9/47.

haemorrhoa Zett. 1838. **G.** Filton (F.) 4/7/46. **S.** Failand (F.) 31/3/46. In *Rumex* spp.

albimargo Pand. 1901. **G.** Filton (F.) 1/7/46, Durdham Down (F.) 5/9/46. **S.** Clevedon (A.) 20/10/39 and 16/7/40. In Caryophyllaceae.

esuriens Mg. 1826. **G.** Coombe Dingle (F.) 28/5/46 and 19/5/47, Filton (F.) 23/5/46. In *Chenopodium* spp.

hyoscyami Panz. 1809. **G.** Blaise Castle (A.) 29/4/28.

var. *betae* Curt. 1847. **G.** Bristol (A.) 8/18. In *Beta vulgaris* L.

var. *chenopodii* Rond. 1866. **S.** Clevedon (A.) 25/4/42. In *Chenopodium rubrum* L.

genupuncta Stein 1906. **G.** Coombe Dingle (F.) 25/5/46. **S.** West Town (F.) 25/5/47. In *Lappa* spp.

interruptella Zett. 1835. **G.** Durdham Down (F.) 2/6/47, Bristol (F.) 1/7/48. In *Solanum dulcamara* L.

squamifera Stein 1906. **G.** Olveston (A.) 30/7/22, Queenhill, Tewkesbury (A.) 11/11/25, Blaise Castle (F.) 8/11/47, Coombe Dingle (F.) 2/5/48. **S.** West Town (Wm.) 7/28, Clevedon (A.) 18/10/40, 23/9/41, 18/6/44 and (F.) 1/11/47. In *Rumex* spp.

rufina Fall. 1825. **G.** Olveston (A.) 8/4/23 and 25/11/22, Filton (F.) 5/5/49. **S.** Shepton Mallet (A.) 5/10/44. In *Agaricus* spp.

nigritarsis Zett. 1838. **G.** and **S.** Fairly common. In *Rumex* spp.

versicolor Mg. 1826. **G.** Cheltenham (Wm.) 4/4/20, Filton (F.) 9/5/47, Coombe Dingle (F.) 24/4/48. **S.** Nailsea (Wm.) 1/5/26, Leigh Woods (H.) 1/7/18, Clevedon (A.) 28/5/44. In *Heracleum* spp. and *Rumex* spp.

fulgens Mg. 1826. **S.** Shapwick (A.) 22/6/25.

caesia Stein 1906. **G.** Durdham Down (F.) 11/6/47, Filton (F.) 24/5/49.

dentiens Pand. 1900. **G.** Coombe Dingle (F.) 4/5/46, Filton (F.) 29/4/49. **S.** Loxley Wood, Shapwick (F.) 21/5/49.

S. G. EMMESOMYIA Mall. 1917 (RHODESINA Mall. 1921)

socia Fall. 1825. **S.** St. Audries (A.) 20/8/29.

HYLEMYA R.D. 1830 (*emend.* HYLEMYIA Macq. 1835)

Medium-sized, dark flies; anal vein reaches the edge of the wing; arista plumose; eyes bare; squamae equal in size; larvae parasitic in plants or coprophagous.

S. G. HYLEMYA *s.str.*

strenua R.D. 1830 (*strigosa* F. 1794 *preoc.*). **G.** and **S.** Common. Larvae coprophagous.

nigrimana Mg. 1826. **G.** and **S.** Fairly common. Larvae coprophagous.

variata Fall. 1823. **G.** and **S.** Common. In Gramineae, possibly cereals.

variabilis Stein 1916. **G.** Olveston (A.) 4/4/23, Bitton (A.) 8/4/27, Hallen (A.) 12/4/26, Coombe Dingle (F.) 14/7/46. **S.** Failand (A.) 30/12/20, Coxley, Wells (F.) 1/6/46. In Fungi.

S. G. LEPTOHYLEMYIA Schnbl. and Dz. 1911

coarctata Fall. 1825. **G.** Cirencester (T.) 21/8/24. In roots of cereals (Wheat Bulb Fly). **S.** Leigh Woods (F.) 7/6/49.

S. G. HYLEMYZA Schnbl. and Dz. 1911

lasciva Zett. 1838. **G.** Painswick (W.), Cirencester (T.) 3/6/33, Coombe Dingle (F.) 2/5/46, Filton (F.) 19/6/47. **S.** Taunton (A.) 9/6/24, Berrow (A.) 7/8/24, Backwell (A.) 17/8/26, Leigh Woods (F.) 5/6/49.

PHORBIA R.D. 1830 (CHORTOPHILA Macq. 1835)

Like HYLEMA, but smaller, arista usually bare and squamae unequal in size ; male genitalia strongly developed.

S. G. PEGOHYLEMYIA Schnbl. and Dz. 1911 (THRIXINA Karl 1928)

brunneilinea Zett. 1845 (*seticrura* Rond. 1866). **G.** Painswick (W.) 7/6/99, Filton (F.) 3/7/46. **S.** Sharpham (A.) 5/9/25, Chewstoke (A.) 8/7/32, Tickenham (A.) 26/4/36.

cinerea Fall. 1824. **S.** Clevedon (A.) 5/4/45.

seneciella Mde. 1892. **G.** Queenhill, Tewkesbury (A.) 1/11/25.

discreta Mg. 1826. **G.** Shepperdine (A.) 8/8/24, Blaise Castle (F.) 5/7/48. **S.** Brockley Combe (A.) 6/21, Shapwick (A.) 16/7/27, Prior Park, Bath (A.) 30/5/29.

humerella Zett. 1838. **S.** Sharpham (A.) 18/4/24.

fugax Mg. 1826 (*pudica* Rond. 1866, *spinosa* Schnbl. *nec* Rond.). **G.** and **S.** Common.

signata Brischke 1888. **S.** Banwell (Sl.) 30/5/18, Blackdown (Sl.) 21/6/21, Chalcombe Bay (Sl.) 22/8/18. On Ferns.

S. G. DELIA R.D. 1830 (CRINURA Schnbl. and Dz. 1911, FLAVENA Karl 1928 *p.p.*, TRICHARIA Karl 1928 *p.p.*)

lepida Fall. 1825 (*exigua* Mde. 1883). **G.** Painswick (W.) 17/9/05, Kingsweston (A.) 1/4/26 and 4/4/27, Bristol (F.) 24/2/46, Coombe Dingle (F.) 22/4/26, Filton (F.) 17/9/46. **S.** Clevedon (W.) 25/5/02, Portishead (A.) 19/4/38, Shepton Mallet (A.) 25/6/42, Cadbury Camp (F.) 12/5/46, West Town (F.) 25/5/47.

florilega Zett. 1845 (*cilicrura* Rond. 1877). **G.** Cirencester (T.) 13/5/23, Littledean (A.) 25/5/31, Hallen (F.) 28/8/49, Coombe Dingle (F.) 31/8/49. **S.** Keynsham (A.) 14/5/22, Leigh Woods (F.) 11/6/49, Walton Moor (F.) 12/6/49, Brean (F.) 8/10/49. On cultivated vegetables.

trichodactyla Rond. 1866. **G.** Painswick (W.) 3/7/97, Cirencester (T.) 24/5/23, Filton (F.) 8/10/46, Durdham Down (F.) 17/9/47, Morton (F.) 1/3/48. **S.** Shepton Mallet (A.) 24/6/42, West Town (F.) 17/5/47. On cultivated vegetables.

tristriata Stein 1900. **G.** Coombe Dingle (F.) 7/4/46.

carduiformis Schnbl. 1911. **G.** Bristol (F.) 15/4/46, Filton (F.) 27/8/46.

criniventris Zett. 1860. **G.** Painswick (W.) 18/7/91, Coombe Dingle (F.) 26/10/47, Blaise Castle (F.) 21/8/49.

cardui Mg. 1826 (*penicillaris* Rond. 1866). **G.** Painswick (W.) 7/7/89, Shepperdine (A.) 30/7/24, Durdham Down (F.) 9/7/46, Coombe Dingle (F.) 19/8/46. On Caryophyllaceae.

antiqua Mg. 1826 (*cepetorum* Mde. 1883). **G.** Painswick (W.) 6/97, Bristol (C.). **S.** Clevedon (A.) 17/6/42 and (F.) 11/5/47. Onion Fly.

albula Fall. 1824 (*arenosa* Zett. 1845). **S.** Berrow (A.) 22/7/22, Burnham (A.) 17/6/24.

intersecta Mg. 1826 (*neglecta* Mde. 1883). **G.** and **S.** Fairly common.

laricicola Karl 1928. **G.** Coombe Dingle (F.) 2/7/49. **S.** Walton Moor (F.) 30/4/49.

pilipes Stein 1916. **S.** Clevedon (A.) 8/8/39.

S. G. Erioischia Lioy 1864

floralis Fall. 1824. **G.** Durdham Down (F.) 23/7/46. **S.** West Town (F.) 21/4/46.

brassicae Bchè. 1833 **G.** and **S.** Common.

S. G. Nupedia Karl 1930

dissecta Mg. 1826. **G.** and **S.** Common.

debilis Stein 1916. **S.** Cadbury Camp (F) 13/4/47.

S. G. Melinia Ringdl. 1929

pullula Zett. 1845. **G.** Cirencester (T.) 15/6/23, Kingsweston (A.) 17/5/24 and 9/8/33. **S.** Clevedon (A.) 5/9/42, Sharpham (A.) 30/6/42, Easton-in-Gordano (F.) 10/9/49.

cannabina Stein 1916. **S.** Cadbury Camp (F.) 11/5/47.

S. G. Botanophila Lioy 1864

varicolor Mg. 1826. **G.** Cirencester (T.) 16/5/24. **S.** Swinford (C.), Clevedon (W.) 25/8/02.

S. G. Pycnoglossa Coq. 1901 (Pogonomyza Schnbl. and Dz. 1911)

Wings with yellow tinge ; proboscis very thick.

cinerosa Zett. 1845. **S.** Clevedon (An.) 19/7/42, Holford (F.) 12/6/48, Sharpham (F.) 19/6/49. Arista pubescent. On *Pterisaquilina* L.

flavipennis Fall. 1823. **G.** Coombe Dingle (F.) 14/7/46. **S.** St. Audries (A.) 24/8/29, Winscombe (A.) 5/7/30, Clevedon (A.) 2/7/40. Arista plumose. On Ferns.

S. G. Phorbia *s.str.*

grisea Rghdl. 1916. **S.** Sharpham (F.) 23/4/49.

moliniaris Karl 1917. **S.** Sharpham (F.) 23/4/49.

curvicauda Zett. 1845. **G.** Coombe Dingle (F.) 8/5/47.

unipila Karl 1917. **G.** Filton (F.) 1/6/48.

sepia Mg. 1826 (*flexicauda* Schnbl. 1911). **G.** Wotton-under-Edge (P.), Filton (F.) 5/5/48.

genitalis Schnbl. 1911. **G.** Coombe Dingle (F.) 14/5/49, Filton (F.) 17/5/49. **S.** Leigh Woods (F.) 11/6/49.

S. G. Heterostylus Schnbl. and Dz. 1911

Mouth protruding ; prealar bristle long ; palpi normal.

atomarius Zett. 1845. **G.** Dursley (A.) 30/3/30.

S. G. Paregle Schnbl. and Dz. 1911

Mouth protruding ; prealar bristle short ; palpi normal.

cinerella Fall. 1825. **S.** St. Audries (A.) 29/8/29.

aestiva Mg. 1826. **G.** and **S.** Common.

radicum L. 1758. **G.** and **S.** Very common.

S. G. Egle R.D. 1830

Mouth protruding ; prealar bristle short ; palpi long, spathulate.

muscaria Mg. 1826 *nec* F. **G.** Painswick (W.) 23/4/91, Filton (A.) 12/6/26, **S.** Tickenham (A.) 24/4/22, Shapwick (F.) 24/3/46, Portbury (F.) 30/3/46. Cadbury Camp (F.) 13/5/47, Leigh Woods (F.) 13/3/48.

parva R.D. 1830. **G.** Bristol (F.) 21/5/46, Filton (F.) 19/7/46 and 23/9/46. **S.** Clevedon (A.) 11/7/31.

OPSOLASIA Coq. 1910 (LASIOMMA Stein 1916)

Like PHORBIA, but eyes hairy.

roederi Kow. 1880. **G.** Painswick (W.), Kingsweston (A.) 17/4/29. **S.** Clevedon (A.) 14/4/48, Ham Green (F.) 19/4/47. Larvae in birds' nests.

meadei Kow. 1880 (*adelpha* Kow. 1880). **G.** Kingsweston (A.) 17/4/29. **S.** Portishead (A.) 19/5/38, Clevedon (A.) 5/9/40.

LEUCOPHORA R.D. 1830 (HAMMOMYA Rond. 1877)

Medium-sized, greyish-brown flies ; arista long-pubescent or plumose ; jowls broad ; eyes bare ; cleptoparasites on *Andrena* spp. *Halictus* spp. and *Colletes* spp.

grisea Fall. 1823. **G.** Coombe Dingle (F.) 11/5/45. **S.** St. Audries (A.) 20/8/29.

albiseta v.Ros. 1840 (*albescens* Zett. 1845). **S.** Swinford (C.).

sociata Mg. 1826. **G.** Bitton (W.) 11/6/04, Shepperdine (A.) 22/8/24, Coombe Dingle (F.) 20/5/49.

HYLEPHILA Rond. 1877

Like LEUCOPHORA, but arista bare and jowls not very broad.

obtusa Zett. 1838 (*unilineata* Stein *nec* Zett.). **G.** Painswick (W.) 29/5/90.

personata Coll. 1920 (*obtusa* Stein *nec* Zett.). **G.** Coombe Dingle (F.) 16/4/47 and 19/5/47. **S.** Portbury (A.) 10/6/39.

sponsa Mg. 1826. **G.** Bitton (W.) 21/8/00, Coombe Dingle (F.) 7/6/48.

ANTHOMYIA Mg. 1803

Medium-sized, whitish-grey flies with distinctive black markings ; eyes bare ; larvae saprophagous.

pluvialis L. 1758. **G.** and **S.** Common.

procellaris Rond. 1866. **S.** Shapwick (A.) 29/6/39, Clevedon (A.) 30/5/39 and 15/7/41.

PARAPROSALPIA Villen. 1922 (PROSALPIA Pok. 1893 *preoc.*)

Rather small, dark-coloured flies ; eyes bare ; arista bare ; male genitalia prominent ; predaceous flies.

silvestris Fall. 1824. **S.** West Town (F.) 21/4/46.

bilbergi Zett. 1838. **G.** Bristol (F.) 15/4/46. **S.** West Town (F.) 26/4/47 and 17/4/49.

sepiella Zett. 1845. **S.** West Town (F.) 13/4/46 and 17/5/47.

conifrons Zett. 1845. **G.** Morton (F.) 13/4/46, Bristol (F.) 1/5/46, Coombe Dingle (F.) 7/9/46. **S.** West Town (F.) 21/4/46.

pilitarsis Stein 1900. **G.** Coombe Dingle (F.) 6/6/49.

S. F. COENOSIINAE

Always three sternopleural bristles situated at the points of an inverted equilateral triangle ; eyes separated in both sexes ; arista short-hairy ; flies predaceous ; larvae zoophagous.

TRIBE :—CHELISIINI

Two pairs of presutural dorso-central bristles.

LISPOCEPHALA Pok. 1893

Basal antennal segments and tibiae fulvous ; abdomen spotted.

brachialis Rond. 1877. **G.** Coombe Dingle (F.) 7/4/47, Durdham Down (F.) 13/3/48, Blaise Castle (F.) 27/3/48.

alma Mg. 1826. **G.** Morton (F.) 17/2/46, Blaise Castle (F.) 28/3/48. **S.** Holford (F.) 12/6/48.

erythrocera R.D. 1830. **G.** Coombe Dingle (F.) 22/4/46. **S.** Shapwick (A.) 15/4/24, 26/8/25 and (F.) 24/3/46.

CHELISIA Rond. 1856

Frons bears crossed bristles ; antennae, palpi and legs black.

monilis Mg. 1826. **S.** West Town (F.) 17/5/47, Portishead (F.) 24/5/47.

LIMNOSPILA Schnbl. 1902

Small, black flies with black antennae and legs.

albifrons Zett. 1849. **G.** Filton (F.) 24/6/46.

SPANOCHAETA Stein 1919

Medium-sized flies with fulvous antennae and legs, and some fulvous on abdomen.

dorsalis v.Ros. 1840. **G.** Coombe Dingle (F.) 19/8/46 and 15/6/47. **S.** Failand (F.) 17/7/49.

TRIBE :—COENOSIINI

Only one pair of presutural dorso-central bristles.

SCHOENOMYZA Hal. 1833

Small, grey flies with dark markings ; face and jowls golden-yellow in male, whitish-yellow in female ; legs black.

litorella Fall. 1823. **G.** Filton (F.) 18/9/46. **S.** Clevedon (W.) 25/8/02, Backwell (A.) 25/4/26.

COENOSIA Mg. 1826 (LIMOSIA R.D. 1830)

Medium-sized to small, greyish-black flies, sometimes with fulvous abdomen, antennae and legs ; flies predaceous.

S. G. CARICEA R.D. 1830

intermedia Fall. 1825. **G.** Painswick (W.) 10/7/92. **S.** Holford (A.) 28/8/29.

means Mg. 1826. **G.** Wotton-under-Edge (P.).

tigrina F. 1775. **G.** and **S.** Common.

S. G. OPLOGASTER Rond. 1856 (HOPLOGASTER Rond. 1870)

mollicula Fall. 1828. **G.** and **S.** Fairly common.

S. G. COENOSIA *s.str.*

humilis Mg. 1826. **G.** Wotton-under-Edge (P.), Shepperdine (F.) 26/9/48. **S.** Sharpham (A.) 6/9/25, Clevedon (A.) 12/9/40.

bilineella Zett. 1838. **G.** Durdham Down (F.) 21/8/47.

geniculata Fall. 1825. **G.** Blaise Castle (F.) 30/7/49. **S.** Berrow (A.) 27/8/24, Priddy (A.) 6/6/37, Clevedon (A.) 8/9/43.

sexmaculata Mg. 1838. **G.** Wotton-under-Edge (P.). **S.** Berrow (A.) 27/8/24.

pulicaria Zett. 1845. **G.** Filton (F.) 2/6/49.

rufipalpis Mg. 1826. **S.** Clevedon (A.) 18/6/44.

tricolor Zett. 1845. **G.** Painswick (W.) 27/7/89, Cirencester (T.) 3/6/24, Durdham Down (F.) 15/9/46. **S.** Clevedon (W.) 6/9/02 and (A.) 23/5/39 and 27/5/40, Leigh Woods (A.) 12/9/28, St. Audries (A.) 29/8/29.

nigridigita Rond. 1866. **G.** Filton (F.) 1/6/49. **S.** Clevedon (A.) 27/5/40, Tickenham (A.) 19/7/42, Walton Moor (F.) 7/5/49.

decipiens Mg. 1826. **S.** Berrow (A.) 29/9/24, St. Audries (A.) 30/8/29, Clevedon (A.) 16/9/41.

pumila Fall. 1825. **G.** Painswick (W.) 22/7/91. **S.** Clevedon (W.) 29/8/02, Shapwick (A.) 29/6/39.

trilineella Zett. 1838. **G.** Durdham Down (F.) 19/7/46.

sexnotata Mg. 1826. **G.** Coombe Dingle (F.) 4/10/47. **S.** Clevedon (An.) 18/7/42.

perpusilla Mg. 1826. **G.** Durdham Down (F.) 19/7/46.

lineatipes Zett. 1845. **G.** Painswick (W.) 7/04, Olveston (A.) 28/6/25, Dursley (A.) 20/6/25, Queenhill, Tewkesbury (A.) 1/11/25. **S.** Leigh Woods (A.) 31/9/27, St. Audries (A.) 23/8/29, Clevedon (A.) 22/8/40, Shepton Mallet (A.) 5/10/44.

ALLOGNOTA Pok. 1893

Costa only reaches apex of second longitudinal vein; small, dark flies; antennae, palpi and legs black.

agromyzina Fall. 1825. **G.** Cirencester (T.) 26/5/23, Kingsweston (F.) 11/6/46, Durdham Down (F.) 17/9/47, Coombe Dingle (F.) 8/5/48, Blaise Castle (F.) 2/10/48. **S.** Leigh Woods (A.) 12/9/28, Clevedon (A.) 29/5/39, Tickenham (A.) 2/10/41, West Town (F.) 25/5/47.

PUPIPARA

Larvae live inside the fly until ready to pupate; the flies are ectoparasites on warm-blooded vertebrates; they are brachypterous or apterous; antennae with two short segments; flies usually found on cattle and sheep or on birds.

Family :—**Hippoboscidae**

Compound eyes present.

ORNITHOMYIA Lat. 1802

Ocelli present; small, brown, flat flies with fair-sized wing; on birds.

avicularia L. 1758. **G.** and **S.** Fairly common.

fringillina Curt. 1836. **S.** Wellow (Mg.) 14/7/06.

MELOPHAGUS Lat. 1804

Apterous; no ocelli, and compound eyes reduced; Sheep Tick.

ovinus L. 1758. **G.** Painswick (W.). **S.** Banwell (Wm.) 6/6/25.

LIPOPTENA Nitzsch 1818

cervi L. 1758. **S.** Buncombe (Cl.) 1/10/49.

STENEPTERYX Leach 1817

Ocelli present, wings long and very narrow; on House Martins and Sand Martins.

hirundinis L. 1758. **G.** Painswick (W.). **S.** Shepton Mallet (C.) 24/8/07, Cannington (St.) 2/9/26, Crewkerne (A. R. Hayward) 6/8/26.

CRATAERINA v.Olf. 1816 (OXYPTERUM Leach 1817)

No ocelli, compound eyes small; wing long, narrowed at apex; on Swifts.

pallida Lat. 1812. **G.** Bristol (Al.) 27/6/07, Clifton (Ty.) 15/7/31. **S.** Clevedon (Wm.) 4/7/27.

Family :—**Nycteribiidae**

No compound eyes, on Bats.

NYCTERIBIA Lat. 1796

No ocelli; head small; body elongated; apterous; legs long.

S. G. CELERIPES Mont. 1808 (STYLIDIA West. 1840)

biarticulata Herm. 1804 (*hermanni* Leach 1817). **G.** Henbury (Slm.). **S.** Dundry (A.) 2/21, Mendip Caves (A.) 25/3/33.

Note " Walton Moor " in all cases refers to Walton-in-Gordano (Som.).

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CORRECTIONS AND ADDITIONS

Corrections :

Page 409—Third line from bottom, delete " Street (Cw.) = Sharpham (A.) " and substitute " Street Heath, Sharpham (Cw.) " for " Street (Cw.) " in subsequent records.

„ 413—Second line from bottom, delete record " Burtlescombe (Cw.) 4/6/48."

„ 447—Seventh line from bottom, " SCILADYNUS " should read " SZILADYNUS ".

„ 457—Twelfth line from bottom, delete all records of *Dolichopus signifer* Hal.

„ 458—Sixth line from top, " 27/6/18 " should read " 27/6/48 ".

„ 466—The bottom line should precede the line immediately above.

„ 467—After fifth line from bottom, add, " Marshall, J F. 1938. *The British Mosquitoes*. British Museum."

All " Hanham " records refer to Hanham, Glos.

Additional Records for the Orthorrhapha :

Family :—**Stratiomyidae**

Eulalia argentata F. 1794. **S.** Street Heath, Sharpham (Cw. and F.) 23/4/49.

Geosargus albibarbus Lw. 1855. **G.** Bristol (F.) 27/9/37.

Family :—**Asilidae**

Dioctria baumhaueri Mg. 1820. **S.** Wembdon (Cw.) 16/6/49.

Machimus (*Epitriptus*) *cingulatus* F. 1781. **S.** Berrow (Cw. and F.) 27/8/49.

Family :—**Empididae**

Gloma fuscipennis Mg. 1822. **S.** Leigh Woods (F.) 11/6/49.

Hilara lurida Fall. 1816. **G.** Coombe Dingle (F.) 28/7/47, Thornbury (F.) 7/7/49.

Empis (*Xanthempis*) *scutellata* Curt. 1824. **S.** Leigh Woods (F.) 11/6/49.

E. prodromus Lw. 1867. **S.** Walton Moor (F.) 7/5/49, Leigh Woods (F.) 11/6/49.

Rhamphomyia (*Pararhamphomyia*) *filata* Zett. 1842. **S.** Shapwick Heath (F.) 24/4/49.

R. subcinerascens Coll. 1926. **S.** Street Heath, Sharpham (F.) 23/4/49.

Family :—**Dolichopodidae**

Dolichopus (*Melanodolichopus*) *picipes* Mg. 1824. **S.** Street Heath, Sharpham (F.) 22/5/49 and (Cw.) 22/5–19/6/49, Walton Moor (F.) 19/6/49.

D. (*Melanodolichopus*) *lepidus* Staeg. 1842. **S.** Street Heath, Sharpham (F.) 22/5/49.

D. (*Eudolichopus*) *wahlbergi* Zett. 1843. **S.** Failand (F.) 24/7/49.

D. longitarsis Stann. 1831. **S.** Street Heath, Sharpham (F.) 19/6/49.

Macrodolichopus diadema Hal. 1832. **S.** Berrow (Cw.) 17/8/49, Easton-in-Gordano (F.) 4/9/49.

Hypophyllus discipes Ahr. 1817. **S.** Edington (Cw.) 28/6/49.

Hydrophorus litoreus Fall. 1823. **S.** Bridgwater (Cw.) 27/9/49, Durleigh (Cw.) 17/9–4/10/49, Nether Stowey (Cw.) 26/9/49, Blagdon (F.) 8/10/49, Failand (F.) 14/10/49.

H. praecox Lehm. 1822. **S.** Nether Stowey (Cw.) 26/9/49.

H. bipunctatus Lehm. 1822. **G.** Filton (F.) 13/9/49. **S.** Bridgwater (Cw.) 27/9/49, Durleigh (Cw.) 4/10/49, Failand (F.) 14/10/49.

Scellus notatus F. 1781. **G.** Filton (F.) 14/9/49.

Porphyrops antennata Carl. 1835. **G.** Coombe Dingle (F.) 3/9/49. **S.** Durleigh (Cw.) 20 and 29/9/49.

P. elegantula Mg. 1924. **S.** Durleigh (Cw.) 26/9 and 4/10/49.

Syntormon macula Par. 1928. **G.** Blaise Castle (F.) 1/8/49 (Male, hitherto unknown). **S.** Failand (F.) 16/4/49.

Eutarsus aulicus Mg. 1824. **S.** Durleigh (Cw.) 20 and 29/9/49.

Machaerium maritimae Hal. 1832. **S.** Brean (Cw.) 17/8/49 and (F.) 27/8/49.

Systenus adpropinquans Lw. 1857. **G.** Coombe Dingle (F.) 2/7/49.

Achalcus cinereus Walk. 1851. **G.** Coombe Dingle (F.) 18/2/50.

Argyra elongata Zett. 1843. **S.** Street Heath, Sharpham (Cw.) 19/6/49.

Additional Record for the Cyclorrhapha :

Family :—**Syrphidae**

Sphegina kimekowiczi Strobl 1897. **S.** Failand (J. Riley) -/4/50. Larva in damp, dead wood.

TEMPORARY EXPOSURES AND BOREHOLE RECORDS IN THE BRISTOL AREA

V. SECTION OF LOWER LIAS AND RHÆTIC AT STANTON WICK

By T. R. Fry

(Received Feb. 10, 1950. Read in title at General Meeting, March 2, 1950)

DURING October, 1949, my attention was drawn by Mr. H. S. Shinner to a trial-shaft being excavated by the West Gloucester Water Company at Stanton Wick, near Clutton, Somerset. The position of the excavation was at Round Hill, at a point approximately 500 yds. S. 10° W. of Stanton Wick Farm, at a height above Ordnance Datum of 513.4 ft. The shaft commenced in the Lower Lias and entered the Westbury Shales but was terminated before the base of the Rhætic was reached. The strata dip in a northerly direction at an angle of 4° ; but, as the hillside shows the incidence of cambering, and, as the black shales are to some extent internally disrupted, this dip is probably greater than the regional dip.

Geological Succession

	Thickness	
	ft.	ins.
Soil and made ground	2	9
Lower Lias : Langport Beds		
Earthy limestone in three thin beds, with some yellowish clay and yielding *Modiolus langportensis* (Rich. & Tutcher), *Parallelodon hettangiensis* (Terquem), *Plagiostoma valoniensis* (Defrance) ...	0	7
Rubbly limestone mixed with grey, calcareous clay with *Pleuromya tatei* var. *langportensis* Rich. & Tutcher, *Cypricardia* sp.	1	3
Greenish clay with some friable limestone...	1	3
Drab, greenish-grey, mottled, earthy limestone in a shattered condition ; *Protocardia phillipiana* (Dunker) was collected ...	0	10
Shaley clay, upper 2½ inches brown, the rest bluish	0	7
Rhætic : Cotham Beds		
Cotham Marble ; mainly a normal development but with brecciated patches	0	4
Bluish, shaley clay	3	9
Shattered, blue-hearted limestone possessing a conchoidal fracture	1	6
Bluish, shaley clay	1	1
Blue-hearted, impersistent limestone having a conchoidal fracture; only visible on east side of section	0	7

Bluish, shaley clay	0	2
Laminated limestone composed mainly of small shell-fragments including *Pleurophorus* sp., fish scales and teeth	0	0½
Greenish, shaley clay	0	1½
Rhætic : Westbury Beds		
Soft, sandy, fissile layer full of crushed shells among which *Chlamys valoniensis* (Defrance), *Pteria* sp., *Gyrolepis alberti* Ag., and *Saurichthys acuminatus* Ag. were identified	0	1½
Black shale with '*Schizodus*' *concentricus* (Moore), *Eotrapezium ewaldi* (Bornemann), *Modiolus sodburiensis* (Vaughan), *Tutcheria cloacina* (Quenst.), *Protocardia rhætica* (Merian), *Myophoria postera* (Quenst.) and *Pteria contorta* (Porlock)	0	3
Dark, earthy limestone, rather hard, with some pyrite	0	0¾
Black shale	0	6+
Total thickness	15	9¼+

TEMPORARY EXPOSURES AND BOREHOLE RECORDS IN THE BRISTOL AREA

VI. A SEQUENCE FROM THE OLD RED SANDSTONE TO LOWER CARBONIFEROUS, NEAR BURRINGTON, SOMERSET

By J. V. Hepworth and A. H. Stride

(*Received, March 1, 1950. Read in title at General Meeting, March 2, 1950.*)

DURING the period 1941 to 1944 the Axbridge Rural District Council drove an adit into the north side of Blackdown in the valley of the West Twin Stream near Burrington. A cutting 60 feet long leads up to the entrance of the adit which lies at a point 140 feet south-west of Goatchurch Cave. The adit is about 5 feet high, 4½ feet wide and 975 feet long ; the inner end lies due south of the entrance, the adit being slightly curved along its length.

Previous work was founded upon the ill-exposed sections seen in the valleys of the Twin Streams, and much of the sequence was necessarily incompletely determined (Sibly, 1904, and Vaughan & Reynolds, 1911). The present section provides information previously unknown about the topmost beds of the Old Red Sandstone and completes the succession of the Lower Carboniferous in detail.

The cutting and adit pass through part of the northern limb of the Blackdown anticline, where the dip of the beds is fairly constant at 45° towards N. 25°E. The succession is straightforward except for small-scale folding in the limestones and shales just inside the entrance to the adit, and zones of brecciation situated at distances of 265 feet, 416 feet and 840 feet from the entrance. A solution cavity 10 feet wide in a massive limestone was penetrated at a distance of 500 feet from the entrance.

The cutting and the mouth of the adit lie in the Lower Carboniferous (K beds), and the tunnel proceeds through the basal Carboniferous into the Old Red Sandstone, finally ending in a massive, red sandstone. Most of the fossils characteristic of the K beds were obtained, including the zonal coral *Vaughania* (*Cleistopora*), which was found near the mouth of the adit by Mr. T. R. Fry.

Details of the section, showing true thickness of beds and lithological and fossil evidence, are presented in the table below.

Geological Succession

		True Thickness (feet)	Total Thickness (feet)
	Carboniferous Limestone : K zone		
22.	Fine-grained, black limestones with shales ; some limestones are richly fossiliferous and contain *Vaughania* (*Cleistopora*) *vetus* Smyth, *Productus* (*Dictyoclostus*) *vaughani* Muir-Wood, *Rhipidomella michelini* (l'Eveillé), *Chonetes* cf. *hardrensis* Phillips, *Camarotoechia mitcheldeanensis* Vaughan, *Spirifer tornacensis* de Koninck, *Syringothyris cuspidata* (Martin), *Cleiothyridina royssi* (l'Eveillé), *Rhodocrinites* cf. *verus* Miller, *Fenestella* sp., *Rhabdomeson* sp.	110	110
21.	Soft, black marl with two thin limestones near base	114	224
20.	Thinly-bedded limestones, more shaley at the base, containing *Orthotetes* (*Schellwienella*) *crenistria* (Phillips), *Chonetes* cf. *hardrensis* and *Camarotoechia mitcheldeanensis*	114	338
19.	Coarsely crystalline, grey limestone with abundant *Chonetes* cf. *hardrensis* and ooliths coated with limonite	6	344
18.	Black shale containing crinoid-fragments and small, phosphatic nodules	4	348
17.	Massive, coarsely crystalline, ferruginous limestone with abundant, rounded crinoid-fragments ; this is a typical Bryozoa Bed and yielded *? Productus* (*Avonia*) *bassus* Vaughan	12	360
16.	Massive limestone, black at the base, with crinoid-fragments ; oolitic and iron-stained at the top of bed. *? P. bassus*, *Camarotoechia mitcheldeanensis*, *Spirifer tornacensis*, *? Syringothyris* sp., and *Platyceras neritoides* (Phillips) were collected	22	382
15.	Dark-grey mudstones, containing *Camarotoechia mitcheldeanensis* and *? Modiola* sp. and carrying an interbedded, thin, sandy limestone rich in *Chonetes* cf. *hardrensis*	32	414
14.	Black, sandy, crinoidal limestones with intercalated, dark shale-bands	16	430
13.	Massive, black, crystalline limestone	7	437
	Upper Old Red Sandstone		
12.	Greenish, micaceous sandstone with bands of red shales	22	459
11.	Black shale, inconsistently laminated, grey at the base	14	473
10.	Massive, grey, current-bedded sandstone	18	491
9.	Dark-grey, micaceous shale	2	493
8.	Massive, grey, current-bedded, calcareous sandstone with shale. A bed of conglomerate, which provided fish- and plant-remains, occurs at the base, and 2 feet above this there is a thin, impersistent, bright coal, no more than one inch thick	62	555
7.	Fault-zone showing wedge-shaped mass of breccia	1	556
6.	Massive, grey sandstone	40	596
5.	Massive, red sandstone with some bands of red shale becoming more flaggy at the top	42	638
4.	Red and green, mottled, slightly micaceous shales	14	652
3.	Strongly micaceous, flaggy, grey sandstone	16	668
2.	Mottled, red and green shale	6	674
1.	Red and green, massive, micaceous sandstone	17	691

The thickness of K beds exposed in the section is 437 feet and, making an allowance for the remaining beds up to the β horizon, the total thickness in this area of the K zone is approximately 500 feet.

As was pointed out by Sibly (1904), there is a general similarity between the sections at Burrington and in the Avon Gorge. Certain points of interest arise, however, from a consideration of the present record. The higher beds of the adit section yield brachiopods characteristic of the K zone and have now been shown to contain the zonal coral *Vaughania* (*Cleistopora*) in addition. This fossil has not previously been recorded in the Burrington area and the recent discovery provides confirmatory evidence as to the stratigraphical position of the beds.

At some distance down the section from the entrance of the adit the Bryozoa Bed is developed (Bed 17). Stratigraphically and immediately above this lies a bed of shale which contains highly phosphatic nodules (Bed 18). In the Avon section the well-known Palate Bed occurs in this position and is rich in phosphatic nodules and in fish-remains. In Burrington the bed of shale has yielded no fish-remains and its equivalence to the Palate Bed cannot be proved, in spite of the specific lithological similarity. If we take into account, however, the juxtaposition of two such unusual beds as are found in each place, it seems safe to conclude that they represent a constant horizon. It may be noticed that the single Bryozoa Bed at Burrington is 12 feet thick while that of the Avon is 10 feet. None of the five bryozoal limestones recorded from the K_2 beds of the Priddy boring (Whittard, 1949) have been discovered in the adit or in its approach-cutting.

Seventy feet below the Bryozoa Bed is a 7 feet thick bed of massive, black limestone (Bed 13) with crinoid-ossicles. Immediately below it and in marked contrast is a greenish, micaceous sandstone ; 96 feet below this sandstone remains of fish and plants have been recovered and a thin coal found (Bed 8). No further limestone occurs lower in the succession as seen as far as the inner end of the adit, and no sandstones occur above the black limestone. In view of the marine fauna of the lowest limestone and the marked lithological distinction between the two rocks, one may point, with more confidence than is usual, to the boundary between the Old Red Sandstone and the Avonian. This abrupt change is, for instance, in marked contrast with the Avon Gorge section, where there is a scarcely perceptible gradation from one System to the other.

The authors would like to express their thanks to Dr. Stanley Smith who identified the fossils, to Dr. J. F. W. McOmie who analysed the phosphatic nodules and to the Axbridge Rural District Council for permission to enter and survey the adit.

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BIRD OBSERVATIONS ON STEEP HOLM, 1949

By R. H. Poulding

(*Received, Feb. 1, 1950. Read in title at General Meeting, March 2, 1950*)

Introduction

SINCE the military occupation of Steep Holm, 1940–1945, the island has been visited regularly by small parties of ornithologists. Stimulated by observations made on these visits, several observers organised expeditions in 1949, covering in all a period of thirteen days. Although not of great duration, it is undoubtedly the longest period in any one year that the island's birds have been studied. As much new information was obtained, an account of these visits may be of interest.

The first visit was made on April 15 by Miss J. Wilshire, Messrs. M. J. Wotton and L. F. Burroughs and the writer. As on all visits, a preliminary survey was carried out on the sea before landing, mainly to observe the Cormorant colony on the north cliffs. The party stayed for four days and three nights, leaving on the morning of the 18th. The weather consisted of light, southerly winds and warm, sunny days, with slight cloud in the early morning and evening.

On May 22 a party of eleven, including Sir Lewis and Lady Fermor, Miss J. Wilshire, Messrs. B. King and W. E. Mayes and the writer, stayed for the day. A fresh, south-east wind prevailed, bringing slight showers from an overcast sky.

The longest stay, June 25 to July 1, was made by Miss J. Wilshire and the writer. Conditions were ideal, light, southerly winds and clear, blue skies lasting throughout.

The last visit, on September 24, was made by twenty-four members of the Bristol Medical Naturalists, which included Dr. O. C. Lloyd and Messrs. H. J. Bland and M. J. Wotton. These observers contributed most of the bird notes for the trip. Weather was again favourable. Considerable sea-mist was present in the morning, with a light, southerly wind increasing to fresh later.

Thus, four expeditions were organised by ornithologists during the year. Thirty-four species were observed, including Magpie, Blue Tit and Sparrow-Hawk, none of which has hitherto been recorded for the island. The passerine population was surveyed, and only Raven, Rock-Pipit, Blackbird, Hedge-Sparrow and Wren were proved to be breeding. The following passerines, known to have bred in previous years (Lewis, 1936), were seen—Linnet, Sky-Lark, Meadow-Pipit, Spotted Flycatcher, Whitethroat, Song-Thrush and Robin, but of these there was no conclusive evidence of nesting during the visits under review. The gull population was also surveyed, with special attention to the Great Black-backed Gull : 553 gulls were ringed by trapping adults and catching the fledglings.

Full details of the island's history, topography, geology, fauna and flora may be found in 'A Survey of Steep Holm' by various authors (*Proc. B.N.S.* 4th S. Vol. VIII, Part 4).

The writer wishes to express gratitude to Mr. H. H. Davis for his help and guidance in the preparation of this paper.

Systematic List

Corvus corax Raven

One resident pair. Two young were reared on the north-east cliffs, and on April 16 these were almost ready to fly. The nest proved inaccessible when an attempt was made with ropes for ringing purposes (L.F.B., R.H.P.). A juvenile was seen flying about the north-west cliffs on May 22. Two adults were present on June 25 and Sept. 24.

Pica pica Magpie

One was observed on May 22 (B.K.). One present on June 25 (R.H.P.) and two on Sept. 24 (M.J.W.). These records are the first for the island.

Chloris chloris Greenfinch

One adult seen on Sept. 24 (M.J.W.).

Carduelis carduelis Goldfinch

On April 15 two were observed flying low over the plateau in a northerly direction. On the next day four were seen off Rudder Rock, apparently making for the Welsh coast. One adult present on Sept. 24.

Carduelis cannabina Linnet

Two flying over the plateau on April 15. One, with Goldfinches, off Rudder Rock on April 16. Two seen on the plateau on same day, and one at the landing-beach on the 17th. A flock of seventeen was present on Sept. 24.

Fringilla coelebs Chaffinch

The only record is of a male on Sept. 24 (H.J.B.).

Alauda arvensis SKY-LARK

Several single birds and parties of two and four seen on Sept. 24 (M.J.W.).

Anthus trivialis TREE-PIPIT

One seen on April 16 (R.H.P.) and one on Sept. 24 (M.J.W.). On both occasions the bird seemed very tired and allowed a close approach.

Anthus pratensis MEADOW-PIPIT

About twelve present on Sept. 24.

Anthus spinoletta ROCK-PIPIT

A survey of breeding birds during the April visit showed a total of eight pairs, distributed more or less evenly around the island. What appeared to be an unmated bird was present in the territory belonging to a pair near Rudder Rock. This species was noted on the remaining three visits, including Sept. 24, when birds were reported in usual numbers (M.J.W.).

Motacilla alba PIED (? OR WHITE) WAGTAIL

One seen in flight off the north side on April 15 and one off the south side on the 16th. One flying low over the north cliffs on Sept. 24. As neither of the birds was observed at close quarters, it is not possible to refer them to either sub-species.

Parus caeruleus BLUE TIT

Single bird seen in Sycamore trees over the landing-beach on April 15—the first record for the island (L.F.B., R.H.P., M.J.W.). On June 27 a small party was seen near the barracks, and a group of three of these proved to be an adult and two juveniles. The birds were noted in the same vicinity during the next few days (R.H.P.). On Sept. 24, two, possibly three, birds were again observed (M.J.W.). These records suggest the possible breeding of the Blue Tit on the island.

Muscicapa striata SPOTTED FLYCATCHER

The only record is of one on the roof of the barracks on Sept. 24 (M.J.W.).

Phylloscopus collybita CHIFFCHAFF

One singing in trees above the landing-beach on July 1 (J.W.). Approximately 200 small warblers were present on Sept. 24. M.J.W. states that the majority of these had dark legs and were most probably Chiffchaffs.

Phylloscopus trochilus WILLOW-WARBLER

A small number (less than ten), mainly above the landing-beach, were present on April 15, when several were singing in various parts of the island, including the exposed Rudder Rock and edges of the north cliffs. Occasional birds seen on subsequent days. See also note under Chiffchaff for Sept. 24.

Sylvia communis WHITETHROAT

One seen on Sept. 24 (O.C.L.).

Turdus ericetorum SONG-THRUSH

Only one seen during the year. This bird was singing on a number of occasions during the June visit, but there was no evidence of breeding.

Turdus merula BLACKBIRD

A survey in April showed the breeding population to be approximately six pairs. A nest built on the ground and partly sheltered by a privet bush was found in the south-east corner. The rim was approximately ten inches from ground level, and the whole nest was firmly constructed on a large base of materials. A juvenile, found feeding on food stores left in the barracks, was caught and ringed (T.6407). Several dead juveniles and two dead adults were picked up during the June visit. Blackbirds were reported in numbers comparable to the April visit on Sept. 24 (M.J.W.).

Erithacus rubecula ROBIN

Noted on all visits except May, but no positive evidence of breeding. A pair was seen above the landing-beach on April 16, and one was present in June—possibly two were. Four or five were singing on the north side on Sept. 24.

Prunella modularis HEDGE-SPARROW

In a survey in April, eleven pairs were located (R.H.P.), and two nests were subsequently found. One, partly destroyed and with a broken egg, was situated in a fork of Alexanders on the plateau. M.J.W. reports usual numbers on Sept. 24. Tetley (1938) mentions the Hedge-Sparrow as having bred, but doubtfully now, and includes it among the occasional visitors to the island. Lewis (1936) records it as a nesting species, and present-day observations show it is undoubtedly a regular breeder.

Troglodytes troglodytes WREN

Sixteen singing males were recorded on April 16. Nests were found in various positions, such as in hanging Ivy on outcrop of rock, in the doorway of an underground ammunition chamber, and in a small cave on the north cliffs. Wrens were again noted on Sept. 24.

Hirundo rustica SWALLOW

The following were seen on Spring passage—three, April 15, a single bird on the 16th, three on the 17th, and three, May 22. Small parties were seen flying west along the south side on Sept. 24.

Delichon urbica HOUSE-MARTIN

One record only—a single bird on Sept. 24.

Apus apus SWIFT

The only observation was of a single bird on June 28 (J.W.).

Falco peregrinus Peregrine Falcon

Single birds were seen on April 15 and May 22. Two were present on Sept. 24. Although resident and usually breeding, there was no evidence of an eyrie this season.

Buteo buteo Common Buzzard

One, a rather pale bird, seen on April 17, circled over the plateau and then departed toward Weston-super-Mare (L.F.B., R.H.P., M.J.W.). Later in the day a Buzzard, perhaps the same, appeared over the barracks on the south side (J.W.). The only previous record is that given in the *Report on Somerset Birds*, 1933, p. 15.

Accipter nisus Sparrow-Hawk

One seen from the sea on the north side on Sept. 24 (M.J.W.). This is the first record for the island.

Tadorna tadorna Sheld-Duck

Thirteen were seen together near Tower Rock on April 15 and, in the same area, a party of twelve on May 22 and of seven on June 25. One disturbed from a well concealed nest under a large bramble bush near the landing-beach on May 22 (R.H.P.). This was the only evidence of breeding.

Anas platyrhyncha Mallard

Two seen in flight off the south side on June 25.

Phalacrocorax carbo Cormorant

Twenty-three occupied nests were counted on the north cliffs on April 15 and on May 22 (R.H.P., B.K.). On April 15 three nests were examined from the cliffs, two of them containing nestlings about a week old. These were fully fledged on May 22 and almost ready to fly. From the size of the nestling on April 15, and taking the incubation period of the species as twenty-eight days, these eggs were probably laid in the first or second week of March. *The Handbook of British Birds* records breeding as being exceptional in early April and gives the latter half of the month and early May as the more usual. This early breeding of the Steep Holm colony was also noted in 1948, when almost fully grown young were seen on May 2. A few adults were present on Sept. 24.

Haematopus ostralegus Oyster-Catcher

Five seen flying along the north side on April 15.

Larus argentatus Herring-Gull

Breeding as usual in large numbers, not only on the cliffs and along the southern slopes, but also intermingling with Lesser Black-backed Gulls on the plateau. Approximate counts were made of the entire population during the season, and the writer's final estimate, after taking into account individual figures of other observers, was about 1,250 pairs.

During the April visit, three attempts made to catch roosting gulls at night with powerful torches proved very successful, especially on the night of April 16. Twenty-three gulls were caught and, of these, seventeen were Herring-Gulls, including fourteen adults, one first-summer bird, one second-summer bird, and one third-summer.

During the May and June visits, 410 fledglings were ringed, 233 of them with an additional yellow, plastic ring.* Thus, 427 Herring-Gulls were ringed during 1949.

Larus fuscus Lesser Black-Backed Gull

The breeding population was estimated at 750 pairs, mainly concentrated on the plateau. A number of pairs were breeding with Herring-Gulls on the slopes, especially in the vicinity of the barrack path, where the two were nesting side by side in about equal numbers ; 103 fledglings were ringed during the June visit, seventy-four of them with an additional red, plastic ring.* Six adults were caught at night in April. This gives a total of 109 ringed during the year.

Larus marinus Great Black-Backed Gull

Twenty-eight occupied nests were found on April 17, while a further count on May 22 resulted in thirty-three occupied nests (R.H.P.). These were distributed mainly along the cliff tops and concentrated near Split Rock in the south-west corner. Two nests were found on a gun-site parapet, and on June 26 one, with a sitting bird, was found on the plateau among nests of Herring-Gulls. Seventeen fledglings were ringed in June. One or two adults were seen on Sept. 24.

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* A number of first-winter gulls with red or yellow plastic rings have been noted, chiefly in the Bristol district.

Sight records from other areas, so far, are of yellow-ringed Herring-Gulls at Minehead and Cardiff, while a red-ringed Lesser Black-backed Gull has been found dead at Southampton.

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	Richmond, Mrs. D. V.	Do.
	Rogers, Miss M. H., M.A.	36 Cotham Pk., Bristol, 6
	Ross, F. Stenhouse	25 Tugela Road, Uplands Estate, Bristol, 3
A.	Rowcliffe, J. P. G.	49 Overnhill Road, Downend, Bristol
	Rudge, Miss D. M.	6 Elgin Pk., Redland, Bristol, 6
	Russell, R. H.	c/o Summer Cottage, Robin Hood's Bay, Whitby, Yorks.

A.	Salmond, P. W.	22 Tyndall's Park Road, Clifton, Bristol, 8
C.	Salter, Miss J. E. R., B.A.	74 Reading Road, Wokingham, Berks.
	Sampson, Miss A. M.	142 Coronation Road, Bristol, 3
	Sampson, Mrs. A.	Do.
*H.	Sandwith, Mrs. C. I., F.L.S.	26 Canynge Square, Clifton, Bristol, 8
	Saunders, Miss C. E.	25 Robertson Road, Eastville, Bristol, 5
	Savery, Miss N. J.	129 Redland Road, Bristol, 6
	Savory, J. H.	Windyridge, Abbots Leigh, nr. Bristol
	Savory, Mrs. J. H.	Do.
L.	Scase, R. P.	Lower Northend Farm, Batheaston, Som.
	Scott, P., M.B.E., D.S.C., M.A	New Grounds, Slimbridge, Glos.
A.	Scott, Miss S. D.	4 Chapel Green Lane, Redland, Bristol, 6
C.	Sharp, Mrs. J. E.	Nempnett, nr. Chew Stoke, Som.
	Shaw, A., A.S.A.A.	34 Whitecross Avenue, Wells Road, Bristol, 4
	Shaw, Mrs. A.	Do.

	Shaw, Miss D.	38 Logan Road, Bishopston, Bristol, 7
*	Shaw, Miss T.	12c Kingsdown Parade, Bristol, 6
	Shinner, H. S.	The Chase, Kingswood, Bristol
	Simpson, Scott, B.A., Dr. rer. nat.	Geology Dept., Bristol University
*	Skene, Prof. M., D.Sc., F.L.S.	Dept. of Botany, Bristol University
	Skene, Mrs. M.	36 Lawrence Grove, Westbury-on-Trym, Bristol
	Skinner, R. A.	39 Apsley Road, Clifton, Bristol, 8
	Sloane, J. F., B.Sc.	Burwalls, Bristol, 8
	Smith, D. Munro, M.R.C.S., L.R.C.P.	Lodge Cottage, Lodge Road, Kingswood, Bristol
	Smith, E. L.	18 Carnarvon Road, Bristol, 6
	Smith, J., M.I.M.E.	Chelwood House, Pensford, nr. Bristol
	Smith, Miss M. A. V.	80 Hampstead Road, Bristol, 4
*	Smith, Stanley, M.A., D.Sc., F.G.S.	69 Claremont Road, Bristol, 7
	Standring, A. J., B.Sc.	44 Pembroke Road, Clifton, Bristol, 8
	Stanhope, Rev. A. J.	182 Bishop Road, Bishopston, Bristol, 7
	Stinchcombe, F. A.	36 Filton Grove, Horfield, Bristol, 7
**C.*	Stride, A. H. B., B.Sc., F.G.S.	21 Rutland Park Mansions, Walm Lane, Willesden Green, N.W.2
C.	Stubbs, R. L.	"Hill View", Haw Lane, Olveston, nr. Bristol
C.	Studer, J. P., B.Sc.	Shell D'Arcy Exploration Party, Owerri, S. Nigeria, Africa
A.	Sutcliffe, A. J.	c/o Mrs. Roberts, 14 Tyndall Avenue, Bristol, 2
	Sutton, M.	14 Woodcroft Avenue, Whitehall, Bristol, 5
C.	Swaine, Miss A. K., F.R.A.S.	Pisang Cottage, Nailsea, Som.

A.	Tarring, Miss J. F.	36 Alexandra Road, Uplands Estate, Bristol, 3
	Tasker, L.	4 Whiteladies Road, Bristol, 8
	Taylor, Miss A. E.	16 Cotham Road, Bristol, 6
	Taylor, G. H.	107 Sylvan Way, Sea Mills, Bristol
	Taylor, Miss M., D.Sc.	Bristol University
	Taylor, S. M., B.Sc., S.I.Mech.E.	23 St. Alban's Road, Bristol
	Taylor, W. R., M.A.	5 Pembroke Vale, Clifton, Bristol, 8
A.	Taylor, Miss S. K.	Do.
	Tetley, Mrs. H.	4 The Avenue, Sneyd Pk., Bristol, 9
A.	Tidman, M. K.	19 Westbury Road, Bristol
	Treasure, H. G.	12 Cornwallis Crescent, Clifton, Bristol, 8
**C.*	Trueman, Sir Arthur E., F.R.S., D.Sc., F.G.S.	38 Belgrave Square, London, S.W.1
A.	Tucker, M.	24 West Park Road, Downend, Bristol
	Tucker, Miss R.	Barrow Court, Barrow Gurney, nr. Bristol
	Turner, Miss D. M.	325 Two Mile Hill Road, Kingswood, Bristol
	Turner, H. W., M.A., F.G.S.	The University, Bristol, 8
	Turner, Mrs. H. W.	The Cottage, Kensington Place, Clifton, Bristol, 8
**H.*	Tutcher, J. W., M.Sc.	7 Victoria Gardens, Bristol, 6 (since deceased)

A.	Vincent, H.	5 Cotham Road, Bristol, 6
A.	Vincent, Mrs. H.	Do.
	Vine, Miss D. J.	64 The Crescent, Henleaze, Bristol
	Vinnicombe, Miss E. J., M.A.	Denver, Ridgeway, Long Ashton, Bristol

	Wakefield, Mrs. G. S.	"Vanda", 2 Southwood Avenue, Coombe Dingle, Bristol, 9
	Walker, Miss A.	Manor Hall, Clifton Hill, Bristol, 8
A.	Walker, D. I. T.	Birdwell Cottage, Weston Road, Long Ashton, Bristol
	Walker, Miss E.	24 Stanley Street, Stapleton, Bristol, 5
C.	Wallington, W. A.	"Penwarden", Station Road, West Town, nr. Bristol
C.	Wallington, Mrs. H. E.	Do.
C.	Wallington, Miss J.	Do.
*	Wallis, F. S., Ph.D., D.Sc., F.G.S.	City Museum, Bristol, 8
	Wallis, Rev. G. C. W., M.C., B.A.	c/o The Rectory, Stapleton, Bristol
	Wareham, Miss C. A. L.	252 Charlton Road, Kingswood, Bristol
	Wareham, Miss F.	Do.
	Wareing, Miss M., B.Sc.	Ivy Cottage, Compton Martin, Bristol
**C.*	Warne, L. G. G., M.Sc., Ph.D.	Dept. of Botany, The University, Manchester, 13
	Watkins, N. A., M.A., F.R.E.S.	9 Druid Road, Stoke Bishop, Bristol, 9
	Watters, Miss E. D., M.A.	The Little House, Frenchay, Bristol
	Watters, Miss M. M., M.A.	Do.
C.	Webb. H. F.	Elmside, Old Town, Wotton-under-Edge, Glos.
	Webb, H. M., B.Sc.	Camp House, Clifton Down, Bristol, 8
	Weedon, Miss M. F.	12 Luccombe Hill, Redland Green, Bristol, 6
	Weir, G. M.	Hursley Hill, Whitchurch, nr. Bristol
	Weir, Mrs. A. M.	Do.
A.	Weir, D. A.	Do.
A.	Weir, Miss M. L.	Do.
**C.*	Welch, F. B. A., B.Sc., Ph.D., F.G.S.	H.M. Geological Survey, Exhibition Road, S.W.7
	Westcott, Miss M. V.	20 Linden Road, Redland, Bristol, 6
	Weston, F. J.	The Tynings, Chew Stoke, nr. Bristol
	Whistler, L. D.	8 Dundonald Road, Redland, Bristol, 6
A.	White, D. G.	85 Runswick Road, Brislington, Bristol, 4
A.	White, J. D.	46 St. Paul's Road, Clifton, Bristol, 8
	Whitehouse, F. W.	8 Old Street, Clevedon, Som.
*	Whittard, Prof. W. F., Ph.D., D.Sc., F.G.S.	Dept. of Geology, Bristol University
C.	Wight, Miss N. W., B.Sc.	23 Clevedon Road, Weston-super-Mare, Som.
	Williams, E. C.	3 Queen Square, Bristol, 1
	Williams, Mrs. G. E.	Strathmore, Passage Road, Westbury-on-Trym, Bristol
C.	Willis, Miss M. P., B.Sc.	"Vancott", Smallways, Congresbury, Som.
	Wills, R. F.	40 Claremont Road, Bishopston, Bristol, 7
	Wills, Mrs. R. F.	Do.
	Wiltshire, Miss M. O. P., D.Sc.	Clifton Hill House, Bristol, 8
	Winchester, Miss D. E.	4 Langton Road, St. Anne's Park, Bristol
	Winnall, T. J.	22 Grosvenor Place, Bath, Som.
**H.*	Womersley, H., F.R.E.S., A.L.S.	Museum, North Terrace, Adelaide, S. Australia
C.	Woodland, P., M.A.	Redwick, Dursley, Glos.
A.	Woolls, H. E. J.	14 Russell Grove, Westbury Park, Bristol, 6
	Wostenholm, Miss M.	2 Lower Hanham Road, Hanham, Bristol
	Wright, M. A.	Woodside, Glebe Road, Long Ashton, Bristol
**C.*	Yonge, Prof. C. M., F.R.S., D.Sc.	The University, Glasgow
	Young, Miss P. B., B.Sc.	4 Normanton Road, Clifton, Bristol, 8

AFFILIATED SOCIETIES

Natural History Society, Diocesan Training College, Fishponds, Bristol
Natural History Society, Grammar School, Dursley, Glos.
Botanical and Zoological Societies, The University, Bristol, 8
Geological Society, Do. Do.
Natural History Society, City of Bath Training College, 101 Sydney Place, Bath
Scientific Society, Red Maids' School, Westbury-on-Trym, Bristol
Bristol Grammar School Field Club, Elton Road, Bristol, 8

HON. LIBRARIAN'S REPORT

1950

IT has unfortunately been impossible to complete the collating and cataloguing of journals, owing to the occupation of the library as a temporary work-room by the Museum authorities for most of the year. It is expected that the Museum's extension will be ready for use during the coming year and it is hoped that the work on the journals may then be continued. The journals awaiting attention are the remainder of the British ones, all the foreign and some of the British ones having already received attention.

The Society is indebted to the Naturforschenden Gesellschaft of Zurich who have presented a long run of back volumes of their publications, viz. *Vierteljahrsschrift der Naturforschenden Gesellschaft, Zurich* Vols. 1–28 (1856–1883) and 51–68 (1906–1923) ; the library already contained this publication from 1924 to date. They have also presented *Neujahrsblatt von den Naturforschenden Gesellschaft*, 1872–79, 1880–84, 86–87, 1890, 94–96, 98, 1902–1925, 27, 29, 1930–39; and *An die Zuricherische Jugend von den Naturforschenden Gesellschaft* 1804, 1825, 27, 1831–52, 1854–65, 1867–1870 ; and twelve occasional papers. The library has also received a gift of one volume from the Botanical section.

Two hundred and twenty-eight parts or volumes of periodicals have been received in exchange for the Society's *Proceedings* during the year. Five numbers of journals have been purchased for completing broken runs, and four volumes of separate works have also been purchased. Subscription volumes have been received from the *Zoological Record* Committee and the Ray Society. Thirty-two volumes of periodicals have been bound, and eleven damaged volumes have been rebound.

An increased number of members has made use of the library during the year, 253 volumes having been borrowed by 57 members.

L. HARRISON MATTHEWS, *Hon. Librarian*

The Hon. Treasurer in Account with the Bristol Naturalists' Society

Dr. RECEIPTS AND PAYMENTS FOR THE YEAR ENDING 31 DECEMBER, 1950 *Cr.*

1949 £ s. d.			£ s. d.	£ s. d.	£ s. d.
	To Members' Subscriptions :—				
	Full	1949 ..	5 0 0		
		1950 ..	254 11 6		
		1951 ..	4 0 0	263 11 6	
	,, (2nd in house)	1949 ..	15 0		
		1950 ..	24 15 0		
		1951 ..	1 0 0	26 10 0	
	Country	1949 ..	2 0 0		
		1950 ..	20 11 0		
		1951 ..	1 0 0		
		1952 ..	1 0 0	24 11 0	
284 19 0					314 12 6
	"Old" Associates	1949 ..	7 6		
8 15 6		1950 ..	6 17 6		7 5 0
	"New" Associates	1949 ..	5 0		
		1950 ..	8 2 6		
6 10 0		1951 ..	5 0		8 12 6
7 0 0	Affiliated Societies	1950 ..			6 0 0
307 4 6					336 10 0
177 4 0	,, Grants towards cost of *Proceedings* (£50 received in 1949)				– – –
	,, Separates and Covers				6 9 8
1 10 0	,, Sale of Bird Lists				3 15 3
21 4 0	,, Sale of other Publications ..				3 19 9
– – –	,, Profit on Dinner				3 19 6
5 6 11	,, Interest on Deposit in Post Office Savings Bank				6 11 11
512 9 5					361 6 1
180 5 9	,, Balance from last Account ..				328 16 1
692 15 2					£690 2 2

A. H. PEACH, *Hon. Treasurer,*
3 January, 1951

1949 £ s. d.		£ s. d.	£ s. d.
	By Subscriptions :—		
1 1 0	Ray Society	1 1 0	
3 5 0	Zoological Society	3 5 0	
2 1 0	S.W. Naturalists' Union	2 2 0	6 8 0
212 3 9	,, *Proceedings* (1949)		247 18 9
14 4 5	,, Stationery and Printing		32 3 6
	,, Postages, etc. :—		
23 17 7	Hon. Secretaries	21 5 1	
4 8 6	Hon. Treasurer	3 14 6	
1 3 6	Hon. Editor	1 0 0	
2 5 11	Hon. Librarian	1 15 0	27 14 7
1 10 0	,, Fire Insurance (Library)		1 10 0
7 2 6	,, Books and Periodicals		15 5 1
1 0	,, Rent (use of Library Room)		1 0
8 0	,, Cheque Books		8 0
9 17 0	,, Fares and Expenses of Meetings		8 12 0
6 10 0	,, Clerical Assistance (issue of Circulars, etc.)		5 10 0
7 0	,, Loss on Dinner		– – –
5 0 0	,, Loss on Coach Outing (Field Committee) ..		2 10 0
42 19 0	,, Book-binding		22 17 6
– – –	,, Repairs to President's Badge of Office ..		6 6
– – –	,, Grants to Sections :—		
	Botanical	10 0 0	
3 13 11	Entomological	3 4 0	
12 0 0	Geological.	21 0 0	
10 0 0	Ornithological	15 0 0	49 4 0
			420 8 11
	,, Balance to next Account :—		
87 16 0	Cash at Bank	126 5 2	
240 18 5	Deposit in Post Office Savings Bank ..	133 1 4	
1 8	Cash in hands of Hon. Secretary	10 6 9	269 13 3
692 15 2			£690 2 2

Audited and found correct

Bristol, 17 January, 1951 F W EVENS, *Hon Auditor*

REPORT OF BOTANICAL SECTION

1950

MEMBERSHIP has again increased and attendances at most meetings have been good. The resignation of Mrs. E. M. Bell, Hon. Secretary of the Section for ten years, was received by all with much regret. In presenting our gift of Book Tokens to Mrs. Bell in gratitude for all she has done for the Botanical Section, Professor Skene spoke highly of her invaluable work as a Field Botanist, of her readiness to help others, and of her work in keeping the Section alive during the difficult war years. Her ardent support of the Section was such that she never missed a meeting throughout her term of office. We are glad that she is not living too far from Bristol to prevent her attendance at some of our meetings, and that she will be able to continue to help and advise.

At the *January* meeting Mr. C. H. Barnes gave an interesting paper on "Botanising in Snowdonia". This was illustrated with excellent herbarium specimens which Mr. I. W. Evans, who accompanied the speaker to Snowdonia, had secured. In *February* Mrs. M. L. Davis, the newly elected Hon. Secretary, gave a talk on the Scilly Isles, illustrated by lantern slides and a colour film. At the *March* meeting Mr. I. W. Evans gave an informative account of his visit to the Carlisle District with members of the Botanical Society of the British Isles, and showed some of the plants gathered on that excursion.

The indoor meetings from April to September were given up as usual to the study and naming of specimens brought in by members.

The Exhibition Meeting held in October was a great success and no fewer than fourteen separate exhibits were staged, some of which were comprehensive and showed with what care the exhibitors had executed their studies in the field. The exhibits included :—

Cereals—Mr. F. W. Evens. *Herbarium specimens of the Thistle Family*—Mrs. E. M. Bell. *Herbarium specimens of Umbelliferæ*—Mr. I. W. Evans. *The Borage Family*, including fresh and pressed specimens and illustrations—Mrs. G. S. Wakefield. *Leaves, flowers, and fruits of Trees*, together with samples of the *polished wood*—Mrs. A. Davies and Mrs. J. C. Wood. *October hedgerow flowers and fruits*—Mr. C. H. Barnes. *Microscopic slides of Mosses and Liverworts*—Mr. E. D. Evens. *Pressed plants* from *bombed sites* in the city—Miss D. Shaw and Miss F. R. Maggs. *Cards depicting British Wild Flowers*—Mr. E. H. Day. *Photographs of the Botanical Gardens, Florence*—Mrs. A. C. K. Fear. *Illustrations of Wild Flowers of Palestine*—Miss V. Cook. *Pressed flowers, mainly from the Mediterranean Region*—Miss N. K. Bullock. *Herbarium specimens of weeds* on *Lias clay*—Mrs. M. L. Davis. A representative collection of *Botanical Books* was brought by Mr. J. H. Lavender, of the City Museum, from the B.N.S. Library, the Museum Library and his own collection.

At the *November* meeting Professor Skene lectured on Ferns, dealing with the life histories of some of the more common, and their classification and identification. The lecture was profusely illustrated by means of the epidiascope. In *December* Mr. I. W. Evans again gave us one of his narrative accounts—this time concerning his visit to Teesdale in search of the botanical specimens which he exhibited at the meeting.

Field-walks were arranged from April to November and Mr. I. W. Evans led no fewer than four—Whitchurch to Keynsham in April, Newton St. Loe in May, Portishead to Clevedon in August, and Hanham to Brislington in September. Dr. Devonshire was the leader in May to Pensford, Stanton Drew and Maes Knoll, and Mr. T. H. Payne led the excursion to the Chew Valley and Mendip in July. In October Messrs. F. W. Evens and C. H. Barnes were leaders to the Blaise Castle Estate which contains an arboretum of some 77 species. The former Chief Forester, Mr. Inglis, joined the party and was most helpful in pointing out and naming the rarer specimens. In November Mr. F. W. Evens was the leader for the study of Mosses in Leigh Woods.

A Geographical Handbook of the Dorset Flora by Ronald Good has been purchased and placed in the Library.

M. L. DAVIS, *Hon. Secretary*

REPORT OF ENTOMOLOGICAL SECTION

1950

AT the 86th Annual General Meeting of the Section held on January 2, 1950, Mr. J. V. Pearman and Mr. C. S. H. Blathwayt were re-elected President and Hon. Secretary respectively. Mr. J. V. Pearman gave a talk on " Book Lice and their Kin ".

On February 6 short talks were given or papers read by members of the Section on the Lepidoptera.

On March 6 Mr. Norman Moore gave a most interesting talk on " Observations and Field Experiments on Dragonflies ".

On Saturday, May 20, the Section held a Field Meeting in conjunction with the Entomological Section of the Somerset Archaeological and Natural History Society at Shapwick. The party from Bristol travelled by coach leaving Bristol at 12.30 p.m. and arriving at Shapwick at 2.0 p.m. and leaving for Bristol at 6.0 p.m. Those who so desired went into Glastonbury by the coach for tea. In spite of a wet night the weather was moderate and *Euphydryas aurinia* was quite common and other species were also taken or seen.

On Saturday, July 1, the Section held an afternoon Field-Meeting at Wickwar. The weather was good but little appeared to be on tne wing, though some *Limentis camilla* were seen.

On October 10 short talks were given or papers read by members of the Section on the Lepidoptera.

On November 7 the Annual Exhibition of the Section was held and several interesting exhibits were shown and explained by members.

On December 4 a most interesting talk was given by Dr. H. E. Hinton on " The Natural History of Insect Pupae " and a discussion followed.

C. S. H. BLATHWAYT, *Hon. Secretary*

REPORT OF GEOLOGICAL SECTION

1950

TWELVE General Meetings were held during the year, of which six were indoor meetings with an average attendance of 56, and six were outdoor meetings with an average attendance of approximately 25.

At the Annual General Meeting, which was held on January 26, the following Officers were elected: Dr. Stanley Smith, President; Mr. H. W. Turner, Vice-President; Mr. I. S. Loupekine, Hon. Secretary; Mrs. A. Marsden, Hon. Treasurer; Mr. D. T. Donovan, Recorder; and Mr. G. E. J. McMurtrie, Hon. Auditor. Sir Lewis Fermor, Dr. A. Marsden, Mrs. M. M. Perkins, Mr. H. S. Shinner, Dr. F. S. Wallis and Professor W. F. Whittard were appointed Committee Members. The formal business was followed by an Exhibition of Members' Collections, which comprised 35 individual exhibits of varied nature.

On February 21 Professor D. M. S. Watson (University College, London) gave an illustrated lecture on "Africa and the Origin of Man", in which he paid particular attention to the remarkable finds made by Robert Broom in South Africa.

On March 16 Mr. Percy Evans (Burmah Oil Company Limited) delivered an illustrated lecture on "Geology from the Air", in which he reviewed the principles of photogeological surveying and explained its use in the production of geological maps.

Of the six Field Meetings held during the Summer, one was a whole-day excursion; three were held in the afternoon, and two in the evening: a motor coach was used on two occasions. On April 29 Professor Whittard, Mr. Donovan and Mr. M. L. K. Curtis led an afternoon excursion to Fretherne, Breadstone and Sharpness, where Lower Lias, Tremadocian and Downtonian strata respectively were examined. On May 24, in place of Mr. Turner who was indisposed, Dr. Stanley Smith guided a party in Bristol where the local building stones were examined. On June 24 a day was spent in the North Cotswolds where, under the leadership of Mr. P. J. Channon, the Jurassic succession was studied in detail. On July 22 the Section visited the Carboniferous inlier at Wick, under the expert guidance of the President. On August 17 Mr. Loupekine led a party to the Hollychrome Brick Company's pit at Kingswood where Coal Measure structures were seen. Finally, on September 16 the Section visited Radstock, under Mr. T. R. Fry's leadership, where collecting was carried out from the Lower Lias and Coal Measure rocks.

On October 18 Dr. Stephenson Buchan (Geological Survey and Museum) gave an illustrated talk on "Geology and Ground Water", in which the Members learned a great deal of the useful work that is being carried out by the Survey's Water Department.

On November 14 Dr. Scott Simpson lectured on "James Hutton and the Birth of the Science of Geology"; he considered Hutton against a background of social and economic changes and also as having been the first to cross the gap existing between geology and philosophy.

On December 14 the meeting was devoted to papers presented by Members. Miss P. B. Young spoke on "Geology in relation to Town and Country Planning"; Mr. D. I. T. Walker on "The Craven Fault at Malham, Yorkshire"; Mr. A. J. Standring on "Triassic Reptiles from the Mendips"; and Mr. I. H. Ford on "Detection of Radioactivity in Minerals and Rocks".

It is with deep regret that the Section records the deaths of Mrs. H. S. Shinner and Professor W. T. Gordon (President 1941–44).

I. S. LOUPEKINE, *Hon. Secretary*

REPORT OF ORNITHOLOGICAL SECTION

1950

"THE WREN THE WREN
THE KING OF ALL BIRDS..."

EIGHT meetings have been held, and once again we are able to report an extremely successful year. By kind permission of the University, the Section has met chiefly in the Physiology Lecture Theatre. Attendance has varied from 50 to 400, with an average of about 135.

At the 27th Annual General Meeting, in *January*, Mr. W. R. Taylor was elected President for a third year, and Mr. H. H. Davis was re-elected Hon. Secretary. The following Field-work Committee was appointed—Mr. A. E. Billett (Chairman), Mr. R. H. Poulding (Hon. Secretary), and Messrs. H. J. Boyd, G. E. Clothier, H. H. Davis, B. King, A. C. Leach and M. J. Wotton. To end the meeting, Mr. J. H. Savory showed films of Peregrine Falcons at the eyrie, and cliff climbing in Cornwall, by the late Lieut. John Bush, R.N.

For a second meeting in *January*, held in the Physics Department, Royal Fort, Field-Marshal Viscount Alanbrooke delighted a large audience with his splendid colour-films of Hobby, Golden Eagle and other birds, and in *February* the Museum Lecture Theatre was filled to capacity for another splendid colour-film—"An Ornithological Expedition to the Canadian Arctic", by Mr. Peter Scott. This was the outcome of Mr. Scott's recent visit to the remote Perry River region in search of the breeding grounds of Ross's Snow-Goose.

The *September* meeting was devoted to exhibits and communications by members. A joint fixture with the British Trust for Ornithology in *October* was the occasion for a talk by Dr. Bruce Campbell, who, in lecturing with slides, on "Birds of a West Highland Region", gave a comprehensive survey of bird-life in the Ardnamurchan area of north-western Argyll. For the *November* meeting the Rev. E. A. Armstrong, well known author on bird behaviour and display, gave a highly interesting talk entitled "The Nature and Function of Mimesis among Birds", while in *December* Mr. R. S. R. Fitter lectured on the Black Redstart, and in a fully documented account dealt especially with the bird's remarkable spread in the British Isles.

Foremost among the Section's activities has been the Summer Field-work Programme, arranged at the *March* meeting. This included a census of rookeries within the City boundary (last undertaken in 1946); a census of North Somerset heronries; duck-counts at the reservoirs; nest-cards; and surveys of several passerine species. The issue of a typescript report of field-work achieved in 1949 was enthusiastically received. A similar report for 1950 is in preparation.

The first of two evening field-excursions in May was a riverside walk from Pill to the mouth of the Avon, and the second a hedgerow and woodland walk at Little Stoke Farm. On May 14 fifty-five members took part in a whole-day excursion to Exmoor; interesting observations included those of Lesser Redpoll, Ring-Ouzel, Dipper, Common Buzzard and Black Grouse.

It is with deep regret that we record the death, on December 19, of Mr. B. W. Tucker. He was a member for fifteen years, during which he made several journeys from Oxford to lecture to the Section. He was also a frequent visitor to Taunton, where he played a leading rôle in the Somerset Ornithological Section. In a far wider sense he will be most remembered for his great work as part author of *The Handbook*, and as editor of *British Birds*.

H. H. DAVIS, *Hon. Secretary*

ACCOUNT OF THE GENERAL MEETINGS
1950

THE 87th Annual General Meeting was held on Jan. 19, the Annual Dinner on Feb. 2, and Lecture Meetings on March 2, March 30, Oct. 5, Nov. 2 and Dec. 7 were addressed by Dr. J. Ramsbottom, Mr. S. A. Barrett, Mr. A. H. Propert, Mr. R. Essex and Mr. Desmond T. Donovan respectively. Attendances ranged from 25 to 50, with an average of 36. There were also General Field-Meetings.

At the Annual General Meeting the election of the new Council was completed and Mr. H. H. Davis was unanimously elected President. The retiring President, Mr. F. W. Evens, delivered his Presidential Address on "A Few of Nature's Forms and Patterns ". He began by saying that no living thing lives in entire isolation, each has relations with other living things, and enters into a larger pattern with other creatures of the same environment. Although Charles Darwin's great contribution to scientific thought, which falls into no compartment, might have broken down the barriers between the compartments of human knowledge, " The dead hand of Linnaeus still lies heavy on the museums, botanic gardens and learned societies of the world ".

There is a unity of living things within a whole of much diversity. " The Great Day of Days of the feast of a man's life is when a man's eye is opened to the unity of things ".

Eighty-one years ago, T. H. Huxley spoke of protoplasm as the " formal basis of all life ", and the later researches of many investigators have amply confirmed his statement, and new branches of science such as genetics have been established.

Protoplasm, in its various forms, contains carbon, hydrogen, oxygen and nitrogen, in a very complex union, and a modern definition is that it is " a mixture of crystalloids and colloids, especially proteins ".

Modern biologists support the view that the essence of an organism is its form, which is more fundamental than the cells which arise from its growth and development.

Taking the small group of organisms called the Mycetozoa as examples of almost naked protoplasm, a brief statement of the various powers of such protoplasm was made, in particular its power to assume a definite external shape, and to divide into spores and non-spores. For the purpose of the address, FORM was confined to the outlines or visible aspects of things common to many species, such as trees, insects, birds and shells. Large scale, small scale and microscopic forms are to be found everywhere, from sun, stars and planets to diatoms, desmids and bacteria.

Forms can be classified as more or less permanent, such as mountains and valleys, permanent but changing, such as the night sky, clouds and deciduous woods. There are also moving forms such as the flight of birds, and collective forms such as the sea-shore.

Man, in his many activities, is a very potent changer of the forms of Nature, especially as agriculturalist, cattle breeder and landscape gardener.

The mathematical basis on which things are built up, determined by the operation of gravity, cohesion and other physical factors upon them, was pointed out. As Professor D'arcy Thompson says, " everywhere Nature works true to scale ".

The lecturer said that PATTERN was used to describe an individual plant, animal, bird or insect, or the various parts of such things, as a bird's feather or the leaves of a tree. Although the endlessly diversified patterns of Nature are subject to the influence of many factors, they maintain their outline and rigidity of form and structure. Professor A. N. Whitehead had said : " Nature is plastic. Mankind is that factor in Nature which exhibits in its most intense form the plasticity of Nature ".

Attention was then drawn to some selected patterns : mathematical patterns like a spider's web ; hexagonal patterns like diatoms, snow crystals and the honeycomb cells of the bee ; shrinkage patterns like the ridges and wrinkles on many seeds ; patterns of motion like the flight of birds and insects ; and plain and coloured patterns in many birds, flowers and insects.

In conclusion it was pointed out that the mental framework of the present age is a new framework and challenges man to new and greater responsibilities in his use of the world in which he is placed.

The address was accompanied by many epidiascope illustrations, diagrams and Natural History specimens. The President thanked Mr. Evens for his very interesting and comprehensive lecture and closed the meeting.

The Annual Dinner was held in the Senior Common Room of the University. About 80 members and guests attended and, after dinner, Mr. J. H. Savory gave a most interesting talk, with lantern illustrations, on "Birds in Lore and Legend".

At the meeting on March 2, Dr. J. Ramsbottom, O.B.E., F.L.S., M.A., D.Sc., spoke on " Fungi and Their Ways ", giving an account in which scientific erudition and popular lore were fascinatingly combined. The talk was beautifully illustrated by coloured lantern slides.

On March 30, Mr. S. A. Barnett, M.A., of the Ministry of Agriculture and Fisheries, showed a film which portrayed vividly how, from widespread evidences of rat activity in a district, the animals are traced back to their breeding centre and how measures are then taken for their complete extermination. Mr. Barnett went on to describe other instances of rodent damage, emphasising the naturalistic rather than the social and administrative aspects of the subject. His talk was illustrated by some interesting and unusual lantern slides.

In October, Mr. A. H. Popert, Conservator of Forests, gave some account of the work of the Forestry Commission and showed a film made in the Forest of Dean. He pointed out that love of the picturesque must not make us unmindful of the need for constant timber replacement to make good loss due to the natural death of existing trees.

At the November meeting, Mr. R. Essex, M.Sc., spoke on "Some Aspects of Reptilian Degeneration ". The talk was followed by a film showing the impressive grandeur of the landscape and waterways of the mountainous district in Zululand where Mr. Essex had collected his material.

In December, Mr. Desmond T. Donovan, B.Sc., F.G.S., described his recent travels in East Greenland and showed some excellent colour transparencies which he had taken there.

FIELD MEETINGS

The first meeting was on April 22, when a visit was made to the National Museum of Wales at Cardiff. Twenty members, under the leadership of Mr. and Mrs. Fear, met Dr. North, Keeper of Geology, who said the Museum exhibits were designed mainly to stimulate interest in field-work, rather than to provide collections of material for naming purposes, although such collections were available for students. In the Geology Department, Dr. North explained the formation of coal and the vegetation from which it is formed. Many plant physiology experiments and various ecological exhibits were shown to the party in the Botany Department, and, in the Department of Archæology, Dr. North explained the recent finds of the Early Iron Age from Llyn Cerrig Bach, Anglesey.

On Saturday, May 13, Messrs. F. W. Evens and I. Evans, and Dr. A. F. Devonshire led a party to the North Nibley area. At Wotton-under-Edge the first halt was made, to climb Wotton Hill and examine two small quarries. The party walked along the edge of the Cotswold escarpment, through Westridge Wood and Brackenbury Ditches (Iron Age Camp) to the Tyndale monument and thence down to North Nibley. Hawkesbury Upton was visited on the return journey, and here the party saw the old church and verified the station for *Draba muralis* on the churchyard walls.

Messrs. Beacham and Payne were the leaders on Saturday, June 17. Sutton Court was the first place visited—here Lord Strachie conducted the party round his ancestral home. At Chewton Mendip some members walked through the Combe while others went to visit the church. After tea the party was conducted round the Forestry Commission's new Plantations at Priddy by Mr. Fowler, the chief warden, and all stages of growth from the seedling stage to three-year old trees were seen. A visit to Priddy Pool concluded the meeting.

The meeting on Saturday, July 15, was held at Limpley Stoke, where, despite the very bad weather, twenty-four members of either the Society or the Bath Natural History Society were led by Mr. Fry and Miss Stevenson of the Bath Society. After finding specimens of *Elecampane* near the station, the party climbed Winsley Hill via footpaths. Here, among other plants, Blue Pimpernel, Chicory, Heath Dodder, Ground Thistle and Pyramid Orchis were observed. Although the rain was still heavy, the party returned to Limpley Stoke via Conkwell and the aqueduct which carries the canal across the Avon.

On Saturday, August 12, Messrs. I. Evans and R. Goodfellow led the party, which made its first stop at Uphill to inspect a quarry. At Brean, because of torrential rain, most of the party visited the church, but one or two of the botanists visited the sand-dunes. Brean Down itself was climbed and the local plant life there fully examined.

The last meeting of the year, on Saturday, September 2, was an all-day one at Exmoor, under the leadership of Mr. and Mrs. Fear. The first stop was at the 12th century Cistercian Abbey at Cleeve, near Washford, where the refectory and the 13th century tiled floor are of particular interest. The village of Dunster with its church and Old Mill was explored during the lunch hour. The party left the coaches at Dunkery Gate and climbed to the top of the Beacon and then descended via the wooded valley of East Water and Horner Water to Horner village. Selworthy was visited *en route* for Minehead, where the low tide enabled the peat deposits on the beach to be examined and specimens of *Pholas* collected.

E. J. VINNICOMBE, *Hon. Secretary*
J. E. HAGUE, *Hon. Secretary, Field Committee*

OBITUARIES

L. F. H. AUDCENT

THE death of H. Audcent on 9 February, 1951, at Clevedon, in his 76th year, will be deeply regretted by two generations of entomologists to whom he had endeared himself by his friendliness, sincerity, reliability, and readiness to place freely at their disposal his wide and thorough knowledge of the British Diptera.

Louis Felix Henri Audcent was born at Keynsham, on June 7, 1875, of French parents. Both parents died when he was quite a child and his early education was received mainly from one of his grandfathers. Later he entered Bristol University College, being awarded in 1896 a John Stewart scholarship, and a botanical bursary in 1898 ; but the need to earn a living prevented him from completing the course for a science degree, and he took a teaching post at Prior Park College, Bath, which he held for four years—from 1899 to 1903.

In 1907 he was appointed to teach French and Botany at Fairfield Secondary School, Bristol, and when the Biology master at the school left, he was transferred to this subject. He was at Fairfield School for more than 25 years and was always strenuously occupied in educational work, there or elsewhere.

In 1910 he married a Parisian lady, who, with their three sons, survives him ; to them we tender our respectful sympathy.

His enthusiasm for natural science was so great that he regularly and continuously burnt the midnight-oil in pursuit of those aspects which particularly interested him. When he began the study of Diptera—the two-winged flies, a very extensive, difficult and little-worked group—is not precisely known, but in 1928 a first instalment of his " Bristol Insect Fauna (Diptera) " was published in the *Proceedings* of our Society. This was followed by supplementary lists every two or three years until 1947 ; then these lists were revised, new records made by himself and friends added, brief diagnostic characters of families and genera inserted and the whole republished in the *Proceedings* for 1948 and 1949, with the aid of a grant from the Royal Society. This is believed to be the most extensive and informative regional list of Diptera in existence. It contains records of more than 2,200 species.

Audcent made a special study of the Tipulinae and Liriopeidae, and his papers on these groups were published in *Trans. Ent. Soc. S. Engl.* and *Trans. Soc. Brit. Ent.* in 1932 and 1934 respectively. They established his reputation as a first-class dipterist, both in this country and abroad.

Later he turned his attention to the Tachinidae, a family of flies which are for the most part parasitic. In 1942 he published a paper in *Trans. Soc. Brit. Ent.* entitled "A preliminary list of the hosts of some British Tachinidae (Dipt.) " which contains the results of an immense amount of observation and research.

A short time before his death, he communicated to the same Society a key to the identification of the British Tachinidae, based upon years of careful examination, comparison and study, not only of the insects themselves but of the European literature. This work would be of the greatest assistance to students of the group. and it is the earnest intention of his dipterological friends to bring about its early publication.

In recognition of Audcent's scientific achievements, the University of Bristol conferred upon him in 1939 the Honorary Degree of M.Sc.; while in 1946 our Society elected him an Honorary Member to mark its appreciation of his long-continued and valuable work.

His former colleagues and old pupils always speak of him with respect and affection ; but so modest and self-effacing was he that few of them know the extent of his scientific attainments.

The entomologists now working at the British Diptera in the Bristol area are conscious of a loss which will be increasingly felt. They could always count upon Audcent's help in any difficulty and had the greatest confidence in his opinions. They have grounds for hoping that his collection of Diptera, containing specimens of about 3,000 species, together with his library of dipterological literature, will become the property of Bristol University and there be available for reference by serious students.

E. E. L.

John William Tutcher

NATURAL Science honours all who have advanced her borders and not least those who, denied the advantages of early education and whose working hours are fully occupied in their craft or business, nevertheless have found time not only to acquire specialised knowledge in some branch of learning but to make their own contribution to the subject. To this group of workers belongs J. W. Tutcher. His knowledge of Jurassic palaeontology and stratigraphy was truly encyclopaedic, and his help was frequently sought by professional geologists.

Tutcher was born in Bristol on June 6, 1858, and died April 10, 1951. At the age of twelve he left school to become apprenticed to the trade of shoe-making. Later he joined his father in business in Broad Street, Bristol, and, after his father's death, carried on the business until his retirement in 1930 at the age of seventy-two. He was wont to relate with no small satisfaction that he made the boots worn by Sir Raymond Priestley on Scott's Antarctic expedition. On his twenty-third birthday he married Miss Sarah Ann Collins of Cleeve, and in Mrs. Tutcher he found a companion who encouraged him in his scientific pursuits. Mr.

and Mrs. Tutcher celebrated their diamond wedding in 1941 ; members of the Geological Section of our Society took this opportunity of expressing their esteem by a presentation to them. Mrs. Tutcher died in 1947.

Tutcher's earliest interest appears to have been microscopy, and he was a member of a microscopical society which then existed in Bristol. Another of his interests was photography ; he was, in fact, a pioneer in the application of the camera to palaeontological illustration. The numerous figures in S. S. Buckman's *Type Ammonites* are largely photographs taken by Tutcher. The plates in Arthur Vaughan's important papers on the stratigraphy and palaeontology of the Carboniferous Limestone, published in the *Quart. Journ. Geol. Soc.*, are from Tutcher's photographs ; these probably include the earliest photographs of coral sections. The illustrations of fossils in Arkell's *Jurassic System in Great Britain* are also mainly from Tutcher's photographs.

It was probably his friendship with Edward Wilson, formerly Curator of Bristol Museum, that led Tutcher to take up the collecting and study of Jurassic fossils. He was a methodical and painstaking collector and it was not unusual for him to cycle to Dundry and collect for a few hours before he began his day's work. A mind perceptive of small details, a critical faculty and imagination are essential in palaeontology, and these are revealed in Tutcher's work. A thorough knowledge of the literature of his particular subject is also essential : Tutcher taught himself sufficient French and German to enable him to read publications in these languages. He was in close communication with most other British workers on Jurassic rocks and fossils and collaborated with W. J. Arkell, S. S. Buckman, Linsdell Richardson, A. E. Trueman, Arthur Vaughan and others. He was always ready to place his knowledge, time and material at the disposal of all, and by his help and encouragement he induced beginners to take an active interest in geology. The keynotes of Tutcher's character were kindliness and modesty.

Tutcher became a member of the Bristol Naturalists' Society in 1901, its President in 1931, and was elected an Honorary Member in 1937. He received from the Geological Society of London, in 1924, part of the Lyell Award, to mark the Society's appreciation of his contribution to geology, and the University of Bristol, in 1927, conferred upon him the Honorary Degree of M.Sc.

Tutcher's name lives in zoological nomenclature : S. S. Buckman, 1918, named an ammonite *Tutchericeras*, and, in 1946, L. R. Cox gave the name *Tutcheria* to a Lias lamellibranch. *Burgundia tutcheri* Kellaway & Smith is a Jurassic stromatoporoid.

Most of his magnificent collection of Jurassic fossils has been acquired by the Bristol Museum, but the ammonites which S. S.

Buckman made types or figured, type and figured lamellibranchs and brachiopods and a few other choice specimens belonging to the last two groups were purchased by the British Museum.

Appreciation of Tutcher's work was not confined to his own country, and it was sometimes assumed on the continent that he held a University appointment : when, some years ago, the writer visited Bonn University, he was presented by one of the teaching staff there with several of the latter's papers and asked to be kind enough to give them to Herr Professor Dr. Tutcher !

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S. S.

BRISTOL BOTANY IN 1950

By Cecil I. and N. Y. Sandwith

(*Received Feb. 14, 1951. Read in title at General Meeting, March 1, 1951*)

THE year 1950 was one of prevailing winds, lack of sunshine and heavy rainfall. In February there were floods in Somerset, gales, hailstorms and some snow. A Little Auk, driven helplessly by the gale, was found dead on March 9 under a stone wall in the orchard at Tickenham. April was a month of high winds, rain, hailstorms and snow. Birch trees in the woodlands were blown down by the gales and many of them were left standing like bare poles with the tops blown off. In spite of this, some Hawthorn was in flower before the first of May. There was a short heat-wave during the early part of June, but the month ended with cold winds and rain which continued at intervals through July and August, when there were hailstorms. September was an exceptionally rainy month and the autumn, generally speaking, was a sad tale of bad weather ending with some heavy snow-storms, cold winds and dismal days in December. Such weather naturally reacted on the bees, butterflies and flowers. However, it was a remarkable season for berries, and those of the Holly, Hawthorn and *Sorbus* were particularly abundant. The birds seem to have left the holly berries on the trees, and a young holly tree with a fine crop of yellow berries (*I. Aquifolium* L. var. *bacciflavum* Weston) was noticed in mid-winter in an obscure corner on Clifton Down.

Naturalists will deplore the loss of so many fine beech trees near Longwood Farm, Failand, sacrificed to the timber shortage.

Fumaria Boraei Jord. Sparingly in one spot on ruins of Glastonbury Abbey, **S.**, *C.I.S.* and *N.Y.S.*

Cardamine impatiens L. A fine patch in Friary Wood, Freshford, **S.**, *O. Buckle* and *Miss E. H. Stevenson.*

Draba muralis L. On a wall at Priston, **S.**, *Mrs. E. M. E. Bell.*

Spergula sativa Boenn. Arable fields near Tyning's Farm and at Charterhouse-on-Mendip, **S.**, Sept., 1922, *N.Y.S.*, see *B.E.C.* 1924 Rep., p. 562 (1925). This record, the first for the district from a wild locality, has never been repeated in these notes or in reports of the *Bot. Sect. Som. Arch.* and *Nat. Hist. Soc.* The only previous record was of a casual occurrence at Ashton

Gate, **S.**, in 1921, see the *Adventive Flora of the Port of Bristol. S. sativa* should be looked for on the Gloucestershire side of our area.

Erodium maritimum (L.) Ait. Crook Peak, **S.**, *C.I.S.* and *N.Y.S.*

Vicia sylvatica L. Friary Wood, Freshford, **S.**, *O. Buckle* and *Miss E. H. Stevenson.*

Lathyrus tuberosus L. Between the old coal-truck lines, Frog Pit Lane, Coalpit Heath, **G.**, *I. W. Evans.*

Prunus cerasifera Ehrh. Some large, old trees of this species grow in a thicket on the edge of Durdham Down towards Sea Walls, **G.**, and are conspicuous by their early flowering in March. This species does not seem to have been recorded previously from the district, but no doubt occurs frequently in a naturalised condition, as it is sometimes planted as a hedge around orchards or is used as a plum stock. It is the Cherry Plum, Mirabelle or Myrobalan Plum. Our Wild Plum (*P. domestica* L.) and Bullace (*P. insititia* L.) are believed to have arisen from crosses between *P. cerasifera* (diploid) and *P. spinosa* (tetraploid). Notable characters of *P. cerasifera* are the glabrous, green, young branchlets, the finely serrate, ovate, light-green leaves which are glabrous except on the midrib beneath, the slender glabrous pedicels, and the quite large flowers which appear in March, with or without the very young leaves. The form with bronze-purple leaves and pink or white flowers is the well-known "*Prunus Pissardii*" of our gardens.

Comarum palustre L. In small patches of dune marsh N. of Berrow church, **S.**, *C.I.S.* and *N.Y.S.* It is strange that this species has not previously been noted by the many botanists who have visited Burnham and Berrow, but neither Dr. Watson nor ourselves have been able to trace any published record.

Sorbus torminalis (L.) Cr. Still in Friary Wood, Freshford, **S.**, whence it was recorded by Sole, *O. Buckle* and *Miss E. H. Stevenson.*

Œnanthe aquatica (L.) Poir. (*Œ. Phellandrium* Lam.). Sparingly in a rhine on Nailsea Moor, **S.**, *C.I.S.* and *N.Y.S.*

Heracleum Sphondylium L. var. *angustifolium* Huds. Frequent at Priston, **S.**, *Mrs. E. M. E. Bell.*

Anaphalis margaritacea (L.) Benth. Walton Bay, **S.**, *I. W. Evans.*

Bidens tripartita L. var. *integra* Koch. Several plants of this form with unlobed leaves were noticed by us last summer on the peat moor near Mudgley, **S.**

Arctium majus Bernh. × *minus* Bernh. (= × *A. nothum* (Rühm.) Weiss.). Westbury Moor, near Wookey, **S.**, August, 1941, *N.Y.S.*

A. majus Bernh. × *pubens* Bab. (= × *A. Debrayi* Senay). Westbury Moor, near Wookey, **S.**, August, 1941, *N.Y.S.* Both these identifications have been confirmed by Dr. J. Arènes, of Paris, to whom specimens were sent at the same time as a large number of sheets of the Kew material of *Arctium.* It is on the basis of these specimens that Somerset is cited for both hybrids in Dr. Arènes' important monograph of *Arctium* published in the *Bulletin du Jardin Botanique de l'Etat, Bruxelles*, vol. xx, pp. 67–156 (1950). Our British, and Bristol, Burdocks will have to be studied afresh in the light of this paper, which does not accept the conclusions of A. H. Evans concerning *A. pubens* Bab. and *A. nemorosum* Lej. The latter, a good species well-marked in S.E. England and apparently elsewhere, has not yet been noted in our area. Field botanists who dread collecting Burdocks may well refer us to Mr. White's humorous remarks on page 385 of his *Flora !*

Cirsium eriophorum (L.) Scop. subsp. *britannicum* Petrak. A small clump, previously un-noticed, in a limestone pasture on the slope at Knightswood, Tickenham, **S.**, *C.I.S.* This fine species is curiously rare on the ridge between Clifton and Clevedon, but is abundant on the rough hillside above the Cider Institute, Long Ashton, where it was noted by *N.Y.S.* in 1922.

Leontodon Leysseri (Wallr.) Beck. A single specimen with creamy-white florets was found by us last summer on Crook Peak, **S.**

Lysimachia vulgaris L. var. *Klinggraeffii* Abromeit. A slight form, with the base of the corolla lobes brownish-red. It no doubt occurs frequently, and the distinctive colouring is not always well marked. It was recorded from Shapwick Moor, **S.**, *Miss Todd*, as a new forma *maculata* Druce, see *B.E.C.* 1918 Rep., p. 290 (1919), and the form was raised by Dr. Druce to varietal rank in the second edition of his *British Plant List* (1928). Later, Mr. C. E. Britton pointed out the apparent identity of Druce's form with the much earlier described var. *Klinggraeffii*, see *Journ. Bot.* 1932, p. 333. We have been unable, so far, to trace the author of the horticultural " var. *grandiflora* " mentioned in *White, Fl.*, p. 494. This was recorded from Saltford railway cutting and was said to have larger flowers, " suffused with red at the bases of the petals ".

L. punctata L. A patch among stones in a wood near Barrow Hospital, **S.**, *Michael Wright.* This is a garden escape, which usually finds a place in British plant lists, since it is frequently seen in wild localities. Apparently the first record for the Bristol district.

Centaurium capitatum (Willd.) Borbâs. Crook Peak, **S.**, *F. K. Makins*, see *Rep. Bot. Sect. Som. Arch.* and *Nat. Hist. Soc.* for 1938. This was a new record for the entire county of Somerset, as well as for our district, which has been overlooked by botanists and has not been noted in the *B.E.C.* Reports or in *Watsonia*. Mr. Makins exhibited his specimen at the Annual General Meeting of the Somerset Society's Botanical Section held at Taunton Castle on March 24, 1949. Later, he wrote to us that he could not remember where he had found his plant on the Peak, on August 19, 1938. Our own search in July, 1949, was quite fruitless ; the slopes were completely burnt up in that hot summer. Last July we tried once more and after a very long search we rediscovered *C. capitatum* growing in some quantity in a very limited area on a slope of the Peak. The plants are extremely dwarf and grow in short, closed, limestone turf with *Lotus*, *Poterium*, *Thymus*, *Festuca*, etc. The flowers of all the specimens were pale pink, fading to cream. Mr. Makins' discovery is surely the most remarkable addition to the flora of Somerset for many years. *C. capitatum* should be looked for on our other dry limestone coast-hills : on account of its free filaments within the corolla tube it cannot be confused with dwarf compact forms of *C. umbellatum*, which are well-known on hills such as Brean Down but seem to be rare or absent on Crook Peak. The next nearest localities of *C. capitatum* are in Glamorgan, S. Devon and Dorset.

Verbascum nigrum L. Long Ashton golf course, **S.**, *Michael Wright.*

Veronica filiformis Sm. Roadside, Priston, **S.**, *Mrs. E. M. E. Bell.* Glastonbury Abbey ruins, **S.**, *C.I.S.* and *N.Y.S.* A garden escape, which spreads rapidly by means of its creeping stems which root at the nodes, see *Fl. Glos.*, pp. 364–365.

Parentucellia viscosa (L.) Caruel (*Bartsia viscosa* L.) has apparently disappeared from Durdham Down, **G.**, after two seasons. *Mr. H. O. Edmonds* searched many times without success in June, July and August, nor could we find any. Now, however, we have a first record of the occurrence of this species on the Somerset side of the district. Dr. W. Watson writes that it was discovered in quantity north of Berrow, **S.**, near the road towards Brean, by *Mr. E. J. Hamlin*, and was seen by members of the Botanical Section of the *Som. Arch.* and *Nat. Hist. Soc.* on the occasion of their excursion there last summer. We agree with Dr. Watson that *P. viscosa* is almost certainly an introduction in this locality, but how it got there is, once again, a mystery.

Hermodactylus tuberosus (L.) Mill. (*Iris tuberosa* L.). Among brambles on a rocky slope at the base of Sand Point, **S.**, *Mrs. R. M. Bennett* and *A. G. Smith.* A specimen was taken to the Bristol Museum and was identified by Mrs. Bell and Prof. Skene. This attractive, spring-flowering Iris, with strange, orchid-like, yellowish-green and purplish-black flowers, is well-known in gardens and has for long been naturalised in various localities in Devon and Cornwall, usually on or near the coast. This is the first record for our district. The species is a native of the Mediterranean Region.

Scilla non-scripta (L.) Hoffmgg. et Link var. *bracteata* Druce. Sodbury Wood, **G.**, *I. W. Evans.*

Eleocharis uniglumis (Link) Schultes. Pasture, flooded in winter, on Nailsea Moor, **S.**, *C.I.S.* and *N.Y.S.* This station is more than a mile distant from the marshy meadow by the Land Yeo between Tickenham and Wraxall whence the species was reported in " Bristol Botany in 1947 ".

Carex strigosa Huds. Friary Wood, Freshford, **S.**, *O. Buckle* and *Miss E. H. Stevenson.*

Botrychium Lunaria L. Grassy verge of a path in Friary Wood, Freshford, **S.**, *O. Buckle.*

ALIENS. Some very interesting species were added to the Bristol adventive flora and are listed separately. Three of them, collected by us on the Portway tip below Sneyd Park, **G.**, were new to Britain ; they were probably introduced with grain from Asia Minor or Syria. Other species noted on the Portway tip included *Papaver Lecoqii* Lamotte, *Hirschfeldia incana* (L.) Legr.-Foss., *Lepidium virginicum* L., *Althaea hirsua* L., fine plants of *Lavatera punctata* All., *Vicia lutea* L. var. *hirta* Lois. (a plant with hairy stems and leaves to which most adventive specimens of *V. lutea* may be referred), *V. narbonensis* L., *Ammi majus* L., *Onopordon Acanthium* L. (*I. W. Evans*) and *Setaria italica* (L.) Beauv. Visits to Avonmouth Docks, **G.**, did not produce much that was new, but several long-established species survive there, for instance, *Lepidium graminifolium* L. and *Lactuca tatarica* C. A. Mey. *Solidago canadensis* L. and *Bidens frondosa* L. were noted on a blitzed site in Victoria Street, **G.** ; and *Solanum nigrum* L. var. *atriplicifolium* (Desf.) Dun. (a first record) and *Chenopodium ficifolium* Sm. were seen on the large tip above the river at St. Philip's, **G.** On the latter tip *Mr. I. W. Evans* found *Briza maxima* L.

Ranunculus marginatus Urv. var. *trachycarpus* (Fisch. et Mey.) Aznavour (*R. trachycarpus* Fisch. et Mey.). Portway tip, **G.** Native of the Near and Middle East. New to Britain. This species resembles *R. sardous* Cr., but the carpels are terminated by a conspicuous triangular or lanceolate beak at least 1 mm. long.

Crambe maritima L. Tip at Corston, **S.**, *I. W. Evans*. Not previously recorded as an adventive.

Trifolium Petrisavii Clementi. Portway tip, **G.** Native of the Near and Middle East. New to Britain. This is allied to the rare alien, *T. nigrescens* Viv., differing from it especially in the more dense-flowered heads of coloured (not white) corollas, which are shorter in relation to the calyx, and in the 2 ovules of the ovary (*T. nigrescens* normally has 4 ovules).

Pimpinella major (L.) Huds. A single large plant in Avonmouth Docks, **G.**, *N.Y.S.* A curious species to occur as an adventive. The first record for the Port of Bristol.

Anthemis hyalina DC. Portway tip, **G.** Native of the Near and Middle East. New to Britain.

Carduus acanthoides L. Avonmouth Docks, **G.**, *C.I.S.* and *N.Y.S.* The true plant, as understood by Continental authors, which very doubtfully occurs wild in Britain. The first record for Bristol.

Rumex scutatus L. On an old wall behind a cottage, Hambrook, **G.**, *I. W. Evans.*

Sisyrinchium Bermudiana L. (*S. angustifolium* Mill.). Durdham Down, **G.**, May, 1947, *C. H. Barnes.* A first record for the Bristol adventive list, and for the Gloucestershire side of the district; but we gather that the plant did not survive to a second season.

HEPATICS. *Eucalyx hyalinus* (Lyell) Breidl. Damp enclosure on Westhay Moor, **S.**, *C.I.S.* and *N.Y.S.* Rare in v.c.6, and not previously reported from the peat moors.

MOSSES. *Mnium affine* Bland. var. *elatum* B. et S. Boggy field, north–east side of Windsor Hill near Shepton Mallet, **S.**, June, 1949, *J. P. M. Brenan*, see *Trans. Brit. Bryol. Soc.* i. p. 386 (1950). New for v.c.6.

Hypnum intermedium Lindb. *Ibid.*, near Shepton Mallet, **S.**, June, 1949, *J. P. M. Brenan, loc. cit.*, p. 388 (1950). New for v.c.6.

Mr. W. R. Price has two interesting articles in last year's *Proceedings of the Cotteswold Naturalists' Field Club.* One, on Denny Island, establishes the position of Denny in the county of Monmouth (see also our note at the end of " Bristol Botany in 1949 "). The other article, entitled " Botanical first records for Gloucestershire from Thomas Lawson's notebook ", is of importance for us since, of the 29 alleged first records listed, no less than 24 are also apparently first written (as distinct from first published) records for Bristol and the Gloucestershire side of Mr. White's area. The Rev. Thomas Lawson (1630–1691) was the friend of John Ray and visited Bristol in 1677, in the course of a tour round England. His visit was thus 15 years later than Ray's first visit to Bristol in 1662, and he was one of the earliest botanical travellers to enter our area. Lawson noted the plants seen by him under their pre-Linnean names in a small book which is now in the possession of the Linnean Society of London and was the subject of an article by Prof. C. E. Raven, in *Proc. Linn. Soc.*, 1947–8, pp. 3–12. Mr. Price has listed the first Gloucestershire records under their modern names, adding Lawson's name and locality, and the vice-county, whether 33 or 34. Of the 25 alleged first MSS. records for Bristol and district 5 of the *Flora of Gloucestershire*, the most interesting are *Caucalis daucoides* from " St. Vincent's rock ", *Obione portulacoides* from " Bristol ", and *Hippophae Rhamnoides* ("*Rhamnus 2nd Clusii,* Sallow Thorn or Sea Buckthorn ") from "Red Cliff". *Hippophae* at Redcliffe, a new record for the county of Gloucestershire (as formerly including portions of the county of Bristol), is something of a mystery unless it was planted. Lawson also noted *Rubia* (but this is *not* a first record, see *White, Fl.*, p. 358), *Linaria minor* and *Asplenium Adiantum-nigrum* at St. Vincent's Rocks, and *Trifolium fragiferum* and *Triglochin maritimum* " in meadow betwixt Bristol and St. Vincent's rock ".

ORNITHOLOGICAL NOTES, BRISTOL DISTRICT, 1950

Compiled from Reports of Members of the B.N.S. Ornithological Section

By H. H. Davis, M.B.O.U.

(*Received Feb. 27, 1951. Read in title at General Meeting, March 1, 1951*)

MEMBERS have spent many hours in the field during 1950, and acknowledgment is again due to all who have contributed to this Report—the fifteenth of the series. Among records deserving special mention are those of a Water-Pipit at Blagdon in October and a Firecrest at the same place in December ; a Hoopoe at Doynton in April ; a Great Spotted Woodpecker, ringed almost nine years before and found dead near Iron Acton in April ; a Night-Heron at the New Grounds in September ; and Curlew-Sandpipers at Severn Beach in May. Other important records include those of a Purple Sandpiper at Steep Holm in April ; wintering Common Sandpipers on the Avon, and at Barrow Gurney, Blagdon and Cheddar reservoirs ; and Glaucous Gulls at Severn Beach in January, Bedminster Bridge and the City Docks in February and March, and the New Grounds on various occasions from early February to mid-April. South-westerly gales in February brought Kittiwakes to Cheddar, and Little Auks to widely scattered parts of the district, while similar gales in September drove Gannets inland to Blagdon ; a Sabine's Gull to Cheddar ; and Manx Shearwaters as high up the Estuary as Severn Beach and the New Grounds.

From the reservoirs, Teal, Wigeon, Pintail, Tufted Duck and Goldeneye were reported in greater numbers than in any previous year, Teal being especially numerous in December when, on the 26th, there was a combined total of about 3,100 at Blagdon and Cheddar. Other noteworthy records are of Bewick's Swans at Cheddar in December ; Gadwall at Barrow Gurney in January, and Blagdon and Cheddar on various dates ; a Ferruginous Duck at Cheddar in December ; and a Red-breasted Merganser at the same place in October. Prolonged stays at Blagdon, early in the year, of a Great Northern Diver and a Black-throated Diver provided unique opportunities for comparative identification, the birds (both in full winter dress) being often together and swimming close inshore. With water at high level in both spring and autumn, waders at the reservoirs were few, but reports include those of a Black-tailed Godwit at Blagdon in August ; Grey Phalaropes at Blagdon and Cheddar in September ; and a Little Stint at Cheddar in September. From Blagdon so scarce a visitor as a Great Snipe was reported in December. Black Terns at Blagdon and Cheddar were counted to the record total of nearly 120 during a single day's observations in May, and a Sandwich Tern was seen at Cheddar in April and another at the same place in September.

The New Grounds geese came under constant review, and among the more noteworthy reports are those of two Grey Lags ; three family parties of Greenland White-fronts ; four Lesser White-fronts ; several Bean-Geese ; and one or two Barnacles. With a maximum total of about 55, in November, Pink-footed Geese were again very much fewer than in former years.

Except where otherwise stated the following systematic notes refer only to 1950, and are the result of observations by B. J. Bailey, A. E. Billett, Rev. F. L. Blathwayt, H. J. Boyd, G. C. Buxton, Miss K. M. Cary, P. J. Chadwick, Miss G. G. Clements, G. E. Clothier, H. H. Davis, E. E. Dunn, H. Dunnicliff, N. J. Durrant, Miss P. Farmer, R. G. Hamilton, L. W. Hayward, B. King, A. C. Leach, Miss C. V. M. Leach, Mrs. R. Millard, R. H. Poulding, Miss A. Pritchard, Miss M. H. Rogers, J. H. Savory, Peter Scott, R. A. Skinner, W. R. Taylor, M. Tucker, D. I. T. Walker, Rev. G. C. W. Wallis, Miss C. A. L. Wareham, Miss F. Wareham, H. F. Webb and M. J. Wotton. Non-member contributors are G. C. S. Ingram and W. L. Roseveare. The appropriate initials are given with all observations.

Thanks are due to Mr. B. King for assistance in checking the records in MS. and for several helpful suggestions.

G = South Gloucestershire **S** = North Somerset

RAVEN *Corvus corax*

G. Nest building by Avon Gorge pair noted, Feb. 12 (K.M.C.), and birds seen, same place, various dates, Mar.-Apr., but no evidence of successful breeding (R.H.P.). One, Severn Beach, Sept. 10 (B.J.B., H.D.). Two, New Grounds, Dec. 20 (H.J.B.).

S. Bred successfully, Brean Down and Sand Point (W.L.R.) ; also Steep Holm (R.H.P.). Two, Backwell Hill, Apr. 20 (R.H.P.) ; two, Burrington Combe, May 13 (M.T.) ; and two nr. Pill, July 25 (C.V.M.L.). Five, Clevedon, Dec. 16 (P.F.) ; two, same place, 26th (G.C.W.W.).

HOODED CROW *Corvus cornix*

G. One frequently seen, New Grounds, early Nov. to end of year ; two, same place, Nov. 12 (H.J.B.).

ROOK *Corvus frugilegus*

G. and **S.** A census of rookeries in the City and County of Bristol again showed that very few colonies now exist within the City boundary. Results, compared with previous census, 1946, may be summarised thus—

	1950	1946
Colonies	12	9
Nests	134	115
Area (sq. miles)	38	38
Nests per sq. mile	3·5	3·0

Seven new colonies reported, and four noted in 1946 found deserted. Largest, Henbury station, 24 nests. Ham Green rookery (largest, with 44 nests, 1946) had decreased to 23. One colony only in heart of City—Queen Square, nine nests. Elms, with majority of 32 over all other species, again the most favoured trees.

MAGPIE *Pica pica*

S. Single bird, Steep Holm, Apr. 7, 9 (R.H.P.). A nest, evidently last year's, found by same observer, suggests that a pair were breeding on the island in 1949.

STARLING *Sturnus vulgaris*

G. Roosting in enormous numbers, Old Wood, Rangeworthy, early in year. The roost broke up in fourth week of Mar., and did not reform in autumn (J. H. Harford per H.H.D.).

HAWFINCH *Coccothraustes coccothraustes*

G. One, New Grounds decoy, several dates, Jan. (S. T. Johnstone *et al.* per H.J.B.). One, Old Sodbury, Mar. 18 (Rev. H. N. Burgess per F.L.B.).

S. Single birds, Backwell Hill, Jan. 7, Oct. 15 (R.H.P.). Scarcer than usual, Leigh Woods, in nesting season (P.J.C.).

SISKIN *Carduelis spinus*

G. One, Durdham Down, Feb. 15—first record for Clifton (A.C.L.). One, Slimbridge, Dec. 21 (P.S.).

S. Up to seven, Barrow Gurney resrs., various dates, Jan. (P.J.C., A.C.L., R.A.S.).

CORN-BUNTING *Emberiza calandra*

G. One, Dyrham, Jan. 18 (F.L.B.). Three singing males between Old Sodbury and Lyegrove, Apr. 20 (M.T.) and 13 singing males, Marshfield, June 26 (M.J.W.).

S. Single bird, Saltford, June 8, but no evidence of breeding (B.K.).

CIRL BUNTING *Emberiza cirlus*

G. Heard in usual haunt, Durdham Down, Clifton, May 18, July 8 (R.H.P., M.J.W.).

S. Pair feeding young, Axbridge, June 10 (R.H.P.). Reported in nesting season from Cheddar res. (R.H.P.), Cleeve and Shipham (M.J.W.), Clevedon (M.T.) and Long Ashton (G.E.C.). Two, Barrow Gurney, Oct. 22 (D.I.T.W.).

SNOW-BUNTING *Plectrophenax nivalis*

S. Single bird, Yeo Estuary, Oct. 8 (W.L.R.).

TREE-SPARROW *Passer montanus*

G. Up to 30, Downend, mid-Feb. to early Mar. (M.T.). Pair, with nest and young, Lyde Green, nr. Mangotsfield, May 30 (M.T.). At least one pair (probably 3 pairs) nested, New Grounds decoy (H.J.B.). Pair feeding fledged young, Little Stoke Farm, late July (H.H.D.). Twenty or more, North Nibley, Oct. 31 (H.F.W.).

S. Party of 12 Saltford, Apr. 22 (B.K.).

WOOD-LARK *Lullula arborea*

G. Pair, with nest and eggs, North Nibley, July 4 (H.H.D., H.F.W.). Party of five, same place, Oct. 15 (H.F.W.).

S. Resident in usual haunt, Backwell Hill (R.H.P.). Two nests, with eggs, Failand, last week of Mar. (N.J.D.) ; nest, with eggs, same place, Apr. 22 (A.C.L., R.A.S.). One, Cheddar res., June 10 (M.J.W.). Seen or heard, Long Ashton, throughout year (G.E.C.).

WATER-PIPIT *Anthus spinoletta spinoletta*

G. What was probably a Water-Pipit was seen, New Grounds, Feb. 25. It first attracted attention by its larger size as compared with nearby Meadow-Pipits, and by its stance, which resembled that of Rock-Pipit. Other characters were the markedly greyer and more uniform upper-parts than in Meadow-Pipit ; very pale breast, with almost entire absence of streaking ; and pronounced whitish eyestripe. In flight the outer-tail feathers appeared white (H.J.B. *et al.*).

S. One with Meadow-Pipits, Blagdon res., Oct. 29 ; identified by B.K., who has forwarded conclusive details of size, call-note and plumage.

ROCK-PIPIT *Anthus spinoletta petrosus*

S. Single bird, presumably of this form, frequently seen, Cheddar res., Oct. 29 to Dec. 11 (B.K.).

YELLOW WAGTAIL *Motacilla flava flavissima*

S. A female in variant plumage (head, nape and mantle grey; throat, neck and breast pale-yellow; eyestripe conspicuously white), Cheddar, June 4, 9. It was paired to a normal male and was feeding young in a field near the reservoir (B.K.).

GREAT TIT *Parus major*

S. One, Steep Holm, Apr. 11. First record for the island since 1926 (R.H.P.).

RED-BACKED SHRIKE *Lanius collurio*

S. Male and fledglings, Cheddar res., July 16, 21 (B.K. W.L.R.).

PIED FLYCATCHER *Muscicapa hypoleuca*

G. Male, Little Stoke Farm, May 3 (H.H.D.).

S. Male, Clevedon Court, Apr. 28 (M.T.). One, Leigh Woods, in spring; remained several days (P.J.C.).

FIRECREST *Regulus ignicapillus*

S. Close views obtained of one at Ubley end of Blagdon res., Dec. 10, by H.J.B., who has supplied full and conclusive details. First record since 1914.

WOOD-WARBLER *Phylloscopus sibilatrix*

S. About ten pairs, Leigh Woods; six nests located (P.J.C.).

GRASSHOPPER-WARBLER *Locustella naevia*

G. One, New Grounds decoy, Apr. 30 (H.J.B.). Heard, Wotton-under-Edge, various dates, May 30 to July 30 (H.F.W.).

S. Frequently heard, Backwell Hill (R.H.P.). Two singing males located, Leigh Woods (P.J.C.). Heard, Hutton, June 2 (W.L.R.).

REED-WARBLER *Acrocephalus scirpaceus*

G. One, New Grounds decoy, May 22 (H.J.B.).

REDWING *Turdus musicus*

G. Roosting in large numbers, probably 3,000 or more, Old Wood, Rangeworthy, throughout Dec. (J. H. Harford per H.H.D.).

RING-OUZEL *Turdus torquatus*

S. Single male, Brean Down, Apr. 12 (W.L.R.).

STONECHAT *Saxicola torquata*

G. and **S.** Continues to be scarce, and very local in nesting season. Breeding reported from Somerset side only. Nest and young, Compton Bishop, Apr. 23 (A.E.B.). Probably bred, Sand Point, where pair feeding fledged young, May 17, and Brean Down, where two pairs and a fledged young bird seen, June 15 (W.L.R.).

REDSTART *Phoenicurus phoenicurus*

G. Pair bred in a laboratory wall, Clifton High School. They began building in south–east corner of Clifton College Close, May 24–27, but by 29th the birds, presumably the same, were seen building at the nearby High School site, where young were successfully reared. Finally, both adults, together with juveniles, reappeared in the original College Close haunt (M.H.R., W.R.T.).

BLACK REDSTART *Phoenicurus ochrurus*

S. Single birds, females or immatures, Uphill, Jan. 12 (W.L.R.), and Easton-in-Gordano, Dec. 2 (J. J. Walling per J.H.S.).

DIPPER *Cinclus cinclus*

G. One, R. Frome, Stapleton, Sept. 1 (G.G.C.).

S. One, R. Chew, Stanton Drew, May 10 (A.E.B.).

NIGHTJAR *Caprimulgus europaeus*

G. Heard and seen, Westridge Wood, North Nibley, May 28, 30 (H.F.W.).

S. At least three pairs, Backwell Hill, in nesting season (R.H.P.). Heard, Bleadon Hill, May 31 (W.L.R.). Two or more pairs, Leigh Woods, June (A.C.L., R.G.H., M.J.W.).

HOOPOE *Upupa epops*

G. One visited Woodlands Farm, Doynton, in early Apr. The bird, first noticed on 4th and still present on 10th, was seen by a gamekeeper, whose accurate description confirms the identification (F.L.B.).

GREAT SPOTTED WOODPECKER *Dryobates major*

G. One, with ring, found dead at Latteridge, nr. Iron Acton, Apr. 10. It had been ringed, as a fledgling, at Rudgeway (*c.* 3 miles further west) June 28, 1941 (A.E.B.).

LESSER SPOTTED WOODPECKER *Dryobates minor*

G. Single birds, Frenchay, Apr. 17 (M.T.) and Avonmouth, Oct. 4 (R.M.). Occasionally seen or heard, Dyrham (F.L.B.) and Stoke Gifford (H.H.D.).

PEREGRINE FALCON *Falco peregrinus*

G. Two, New Grounds, Jan. 21 (M.J.W.), and one Mar. 8 (H.F.W.), Dec. 11 (M.T.). One, Severn Beach, Sept. 18 (H.H.D.). Single birds, Avon Gorge, Oct. 26 (M.T.), Dec. 25 (R.H.P.).

S. Reported from Brean Down and Steep Holm in nesting season, but no conclusive evidence of breeding (R.H.P., W.L.R.).

HOBBY *Falco subbuteo*

G. One overhead, Dyrham, Aug. 26 (F.L.B.).

MERLIN *Falco columbarius*

G. One, New Grounds, May 10 (H.J.B.).

S. Ad. male, Sand Point, Jan. 21 (W.L.R.). One, Blagdon res., Dec. 17 (B.K.).

COMMON BUZZARD *Buteo buteo*

G. Reported from following widely separated localities—one, New Grounds, Jan. 25, 29, Feb. 19, June 4 (H.J.B., P.S.) ; one, Stoke Gifford, Mar. 26 (H.H.D.) ; two, Tortworth Court, Apr. 7 (M.T.) ; one (sometimes two), Wotton-under-Edge, various occasions, Apr.–Oct. (E.E.D., H.F.W.) ; one, Dyrham Wood, several dates, late Aug. (F.L.B.) ; two nr. Badminton, Sept. 2 (Commander H. Wells per F.L.B.) ; and one, Damery, Sept. 10 (A.E.B.). Single bird twice seen over northern outskirts of the City—Purdown, Sept. 14 (B.J.B.) and Horfield, Oct. 21 (M.T.).

S. Reports from B.K., R.H.P., W.R.T. *et al.* show clearly that the bird is now resident over a wide area. Nest, with two eggs, Upper Langford, May 13 (N.J.D.). Pair nested, unsuccessfully, nr. Wraxall (A.C.L., R.A.S.).

COMMON HERON *Ardea cinerea*

S. Twenty-three occupied nests, Brockley Combe, Apr. 23 (B.K. *et al.*) ; Banwell Heronry deserted owing to extensive tree-felling (G.E.C., R.H.P.) ; 19 occupied nests, Uphill, May 26—an increase of seven over 1949 total. In contrast to Brockley Heronry (23 nests in total of 5 trees) the Uphill nests were spread over 17 trees (Mrs. M. J. Whitting per B.K.).

NIGHT-HERON *Nycticorax nycticorax*

G. An adult flying low over Severn Wildfowl Trust enclosures, New Grounds, Sept. 4, was recognised by its small size ; its retracted head, giving short-necked appearance and making black of crown merge with black on back ; and its white under-parts, as compared with grey coloration of wings (P.S., H.J.B.). Subsequently seen twice on the ground (once at 30 yds. range) by F. R. H. Brain and E. J. B. Langhorne, who found that the white under-parts and markedly yellow legs attracted particular attention. First record for the district, and the first Gloucestershire record for many years.

BEWICK'S SWAN *Cygnus bewickii*

S. Party of eight adults and two immatures, Cheddar res., Dec. 26 ; party of two adults and seven immatures, same place, 31st (B.K.).

GREY LAG-GOOSE *Anser anser*

G. One, New Grounds, Jan. 3 to Mar. 1 ; another, same place, Mar. 1 to 15 (H.J.B., P.S. *et al.*).

WHITE-FRONTED GOOSE *Anser albifrons albifrons*

G. Wintering at New Grounds in usual large numbers. Maximum totals *c.* 3,500, Jan. 29, and 3,100, Dec. 29 (H.J.B.). White-fronts, up to 40 or more and doubtless of this form, seen overhead at Stoke Bishop, Dyrham and Stoke Gifford, second half of Dec. (A.C.L., F.L.B., H.H.D.).

Interesting ringing recoveries are of one ringed, New Grounds, 18/2/48, and shot, Schleswig Holstein, 11/12/50, and of four ringed, same place, 27/2/50, and recovered in central and arctic Russia during spring (one, Kursk, 4/4/50 ; two, Kanin Peninsula, 21/5/50, and one Kolguev Is., 25/5/50).

GREENLAND WHITE-FRONTED GOOSE *Anser albifrons flavirostris*

G. Family party of five (first seen, Nov. 1949) remained to Mar. 3 or later. Family party of six frequently noted, Nov. 27 to end of year ; another of three seen Dec. 20, but not subsequently (H.J.B., P.S.).

LESSER WHITE-FRONTED GOOSE *Anser erythropus*

G. Again seen among common White-fronts at New Grounds. Adult pair, Jan. 6 to Mar. 1 (H.J.B., P.S., M.J.W. *et al.*), and an immature (second record only of a young bird in Brit. Isles), Jan. 15 to Mar. 1 (H.J.B., H.H.D., P.S., *et al.*). Single adult, several dates, second half of Dec. (H.J.B., P.S.).

BEAN-GOOSE *Anser fabalis*

G. At least two, New Grounds, Feb. 7 to Mar. 1 ; two, same place, second half of Dec. (H.J.B., P.S.).

PINK-FOOTED GOOSE *Anser brachyrhynchus*

G. One, New Grounds, Feb. 3 to Mar. 2 (H.J.B., H.H.D. *et al.*). First autumn arrivals, same place, were two, Sept. 23, but 26 present on 27th. Highest counts—51, Oct. 24 and *c.* 55, various dates to Dec. 14. Only one remained at close of year (H.J.B., P.S.).

BARNACLE-GOOSE *Branta leucopsis*

G. One, New Grounds, Jan. 1 to Feb. 27, and one Dec. 30, 31 (H.J.B., H.H.D. *et al.*).

CANADA GOOSE *Branta canadensis*

G. Party of five visited Severn Wildfowl Trust enclosures, New Grounds, for first fortnight of Apr. (H.J.B.).

SHELD-DUCK *Tadorna tadorna*

S. Reservoir records : four, Blagdon, Jan. 29 (B.K.), Apr. 22 (M.T.) ; five, Barrow Gurney, Dec. 30 (G.E.C.). 116, Sand Bay, Jan. 17 ; 119, Yeo Estuary, Apr. 16 ; 270, Axe Estuary, Oct. 22 (W.L.R.) ; 20, Steep Holm, Apr. 7 (R.H.P.), June 18 (W.L.R.).

MALLARD *Anas platyrhyncha*

S. 400, Sand Bay, Jan. 18 (B.K.) ; 450, same place, Oct. 25 (W.L.R.). Maximum count at reservoirs—350, Cheddar, Dec. 31 (B.K.).

GADWALL *Anas strepera*

S. Single birds, Cheddar res., Jan. 1, 15, and two, Feb. 19, Oct. 22 (B.K.). Three pairs, Barrow Gurney resrs., Jan. 29 (G.E.C., P.J.C.). Four, Blagdon res., Apr. 9 (B.K.), and one, Apr. 29, Dec. 28 (M.J.W.).

TEAL *Anas crecca*

S. 1,850, Cheddar, Dec. 26, and 1,250, Blagdon, same date, are the largest counts yet reported from the reservoirs (B.K.).

GARGANEY *Anas querquedula*

G. Male, New Grounds decoy, May 26, 27 ; female in Severn Wildfowl Trust enclosures, early Sept. (H.J.B.).

S. Pair, Cheddar res., Mar. 11, 26 (B.K.). Pair or two, Blagdon res., mid-Apr. to late July, but no evidence of breeding (B.K., H.H.D., M.J.W.).

WIGEON *Anas penelope*

G. 200, Severn Beach, Jan. 14 (B.J.B.) and 210, Dec. 31 (P.J.C.). Many, perhaps 800, New Grounds, Jan. 22 (H.H.D.).

S. Several counts of over 500, Blagdon res., Jan.-Feb. Maximum number, 626 (highest yet for the reservoirs), Feb. 14 (B.K.). About 60 on flooded ground, Kenn Moor, Dec. 23 (D.I.T.W.).

PINTAIL *Anas acuta*

G. 127 in Estuary off New Grounds, Dec. 30 ; largest count yet from Severn (P.S.).

S. Record counts of 61, Cheddar res., Feb. 14, and 41 on 19th. Such unusually high totals were, perhaps, the result of severe south-westerly gales (B.K.). Six, same place, Dec. 31 (B.K.). Up to six or seven, Blagdon res., various occasions (R.G.H., A.C.L., R.A.S.).

SHOVELER *Spatula clypeata*

S. Highest reservoir counts—75, Blagdon, Dec. 17, and 90, Cheddar, 26th (B.K.).

RED-CRESTED POCHARD *Netta rufina*

S. Female, Cheddar res., Sept. 24 ; probably not a genuinely wild bird (H.H.D., B.K.).

COMMON POCHARD *Aythya ferina*

G. Male, Cumberland Basin, Dec. 25 (R.H.P.).

S. Maximum count at reservoirs—543, Blagdon, Jan. 29 (B.K.). Pair may have nested, Blagdon, but evidence not conclusive (G.C.B., M.T.).

FERRUGINOUS DUCK. *Aythya nyroca*

S. Ad. male, Cheddar res., Dec. 26. The bird, viewed with telescope at 70 yds. range, was under observation for about five minutes, and was confidently identified by B.K., who reports the following details—head bright chesnut, with conspicuously white eye and small white patch on chin ; neck chesnut, with darker and more brownish markings on lower breast ; under-parts white ; and back dark-brown with prominent white wing-patch. B.K. also reports that so important a character as the white under-tail feathers was not seen as the bird, when swimming, presented only a head-on view, but that the white of both wing-patch and under-parts was very noticeable whenever the bird dived, and when it ultimately took flight.

TUFTED DUCK *Aythya fuligula*

S. Maximum total, highest yet for the reservoirs, 527, Blagdon, Oct. 29 (B.K.).

SCAUP *Aythya marila*

S. Up to three, Blagdon res., various occasions, Feb.–May and Oct.–Dec. (P.J.C., B.K., M.T.). Four, Barrow Gurney resrs., Oct. 8 (R.A.S.).

GOLDENEYE *Bucephala clangula*

S. Noted at reservoirs in higher numbers than in any previous year (B.K., A.C.L., M.T. *et al.*). Maximum counts, Cheddar, Jan. and Dec.—29 (8 ad. males), 23 (7 ad. males) and 26 (10 ad. males), and Blagdon, Jan.–Mar., 24 (12 ad. males), 30 (14 ad. males) and 26 (12 ad. males). Sum total of 50 at the two reservoirs, Jan. 15 (B.K.).

COMMON SCOTER *Melanitta nigra*

S. Ad. male, Cheddar res., Sept. 27 (P.J.C.) ; what may have been this bird was found dead, same place, 30th (B.K.). One, female or immature, Barrow Gurney resrs., Dec. 31 (D.I.T.W.).

GOOSANDER *Mergus merganser*

S. Up to five (including ad. males, several occasions), Blagdon and Cheddar resrs., various dates, Jan., Mar. and Dec. (A.C.L., P.J.C., M.J.W. *et al.*). Two, Barrow Gurney resrs., Feb. 6 (G.E.C.).

RED-BREASTED MERGANSER *Mergus serrator*

S. One, female or immature, Cheddar res., Oct. 8 (B.K.).

SMEW *Mergus albellus*

S. Frequent, up to ten (mostly redheads, but some ad. males), Blagdon and Cheddar resrs., Jan.–Mar. and Dec. (G.C.B., H.D., B.K., R.H.P. *et al.*). Ad. male, Barrow Gurney resrs., Jan. 21 (B.J.B., P.J.C.), and two redheads, Feb. 18 (A.C.L.).

CORMORANT *Phalacrocorax carbo*

S. Occupied nests, Steep Holm, Apr. 7, totalled 23, five being on Rudder Rock, where the birds have not been found breeding previously (R.H.P.).

GANNET *Sula bassana*

G. Storm-driven bird found alive, Horfield, Sept. 18 (*Evening World* per P.J.C.)

S. Two fishing over Blagdon res., Sept. 18, following severe south-westerly gales (G.C.B.) ; what may have been one of these found dead, same place, Oct. 8 (G.C.B., P.J.C., B.K.). Another storm-driven bird found alive in car park, Weston-super-Mare, Sept. 23 (*Evening Post* per P.J.C.).

MANX SHEARWATER *Puffinus puffinus*

G. The following storm-driven birds reported—one found alive, Uley (in Cotswolds), Sept. 11 (H.J.B.); one in flight over Estuary. New Grounds, 12th (H.J.B.); two in flight off Severn Beach, 17th (M.T.), and one found dead, same place, 18th (H.H.D.).

SLAVONIAN GREBE *Podiceps auritus*

S. Single bird, Blagdon res., Feb. 20 (B.J.B., M.J.W.). Cheddar res.—one, Feb. 14; two, 19th; and one, Oct. 29 (B.K.).

BLACK-NECKED GREBE *Podiceps nigricollis*

S. Two, Blagdon res., Jan. 26, Mar. 10 (W.L.R.). Single birds, Barrow Gurney resrs., July 30 (R.H.P.), Feb. 12 (P.J.C.), and Cheddar res., Oct. 22 (B.K.).

GREAT NORTHERN DIVER *Colymbus immer*

S. Two, Blagdon res., Jan. 8 (B.K.); one, frequently noted, same place, Jan. 11 to Mar. 20 (B.J.B., R.A.S., M.T., G.C.W.W. *et al.*).

BLACK-THROATED DIVER *Colymbus arcticus*

S. One, evidently an adult in full winter plumage, Blagdon res., Feb. 5 to Mar. 20 or later (P.J.C., H.H.D., B.K., M.J.W. *et al.*). Only one previous record (cf. *Proc. B.N.S.*, 1946, p. 172).

TURTLE-DOVE *Streptopelia turtur*

G. Three pairs nested, New Grounds decoy (H.J.B.).

S. Two young ringed from nest, Backwell Hill, June 16 (R.H.P.).

BAR-TAILED GODWIT *Limosa lapponica*

G. Three, New Grounds, Apr. 4 (H.J.B.), and one, Aug. 13 (S. T. Johnstone per H.J.B.).

S. One, Sand Bay, Dec. 7 (W.L.R.).

BLACK-TAILED GODWIT *Limosa limosa*

G. New Grounds—four, Aug. 13 (H.J.B.); 19 on 18th (J. H. P. Allan and C. N. Mallinson per H.J.B.); and three, 26th (L.W.H.).

S. Single birds, Blagdon res., Aug. 13 (P.J.C., M.T.), and mouth of R. Kenn, Sept. 9 (P.J.C.).

GREAT SNIPE *Capella media*

S. One identified, Blagdon res. (Ubley end), Dec. 27. The bird, flushed three times, was seen by B.K. and M.J.W., who report that on each occasion it rose without calling, and with flight more direct than in Common Snipe. B.K. records that it looked larger than Common Snipe and that the outer-tail feathers were conspicuously white; also that when first flushed it alighted about 35 yds. distant, and in full view, thus enabling both observers to note (with telescope) the heavily barred flanks, and shorter-looking bill than in *C. gallinago*. Detailed pencil-sketches by M.J.W. confirm the identification (cf. *Proc. B.N.S.*, 1949, p. 36 for previous Blagdon record).

JACK SNIPE *Lymnocryptes minimus*

G. One, New Grounds, Nov. 19 (P.S.).

S. Single birds, Blagdon res., Feb. 14 (B.K.), 27 (M.T.), Dec. 3 (P.J.C.), and Long Ashton, Nov. 23 (D.I.T.W.).

GREY PHALAROPE *Phalaropus fulicarius*

S. Two, Cheddar res., Sept. 17 (B.K.). Two, Blagdon res., Sept. 17, 18 (P.J.C.) ; one, same place, 21st (A. MacLaughlin per P.J.C.).

TURNSTONE *Arenaria interpres*

G. Largest count, Severn Beach, 205 Jan. 21 (B.J.B.).

S. Party of six, Clevedon, Sept. 1 (P.F.).

KNOT *Calidris canutus*

G. About 200, Severn Beach, Feb. 19 (B.J.B.). Up to six or seven, same place, various dates, Aug.–Sept. (G.G.C., A.C.L. *et al.*). One, New Grounds, Aug. 26 (L.W.H.).

CURLEW-SANDPIPER *Calidris testacea*

G. Two (one in partial-red dress), Severn Beach, May 13 ; seldom reported in spring (B.K.). Single birds, same place, Sept. 17 (H.H.D.), Oct. 1 (M.T.), and six, Sept. 25 (M.T.).

LITTLE STINT *Calidris minuta*

S. One, Cheddar res., Sept. 27 (P.J.C.).

PURPLE SANDPIPER *Calidris maritima*

S. Single bird, Steep Holm, Apr. 4, 8 : first record for the island (R.H.P., M.J.W.).

SANDERLING *Crocethia alba*

G. Up to 12, Severn Beach, various dates, May (H.H.D., B.K., M.J.W.) ; 40 or more, New Grounds, May 22, 23 (H.J.B.) ; 7, New Grounds, Aug. 26 (L.W.H.); and up to 14, Severn Beach, various dates, late July to late Oct. (P.J.C., H.D., A.C.L.).

RUFF *Philomachus pugnax*

G. One, New Grounds, Aug. 28 (H.J.B., P.S.).

COMMON SANDPIPER *Actitis hypoleucos*

G. Single wintering birds, Sea Mills, Jan. 14, Feb. 12 (R.H.P.). Flock of ten in Estuary, New Grounds, July 14 (H.J.B.).

S. At least 45, Cheddar res., May 1 (B.K.). Several, perhaps half-a-dozen, wintering birds reported : one, Blagdon res., various dates, Jan. 11 to Mar. 26 (G.C.B., P.J.C. *et al.*) ; one, Barrow Gurney resrs., various dates, Jan. 22 to Mar. 12, and Nov. 5 to Dec. 3 (P.J.C., A.C.L., R.H.P.) ; one, Cheddar res., Oct. 29, and two, several occasions, Nov. 12 to Dec. 28 (G.G.C., B.K., M.T., C.A.L.W.). One (or two) R. Avon, nr. Pill, Dec. 23 (R.H.P.).

GREEN SANDPIPER *Tringa ochropus*

G. One, New Grounds, June 14, 27 (H.J.B.), and Aug. 15 (S. T. Johnstone per H.J.B.).

S. One, Cheddar res., Aug. 7 (P.J.C.). One, Blagdon res., Aug. 13 (P.J.C., M.T.), Nov. 5 (B.K.), and two, Sept. 9 (A.C.L.). Single bird, Yeo Estuary, Dec. 23 (D.I.T.W.).

GREENSHANK *Tringa nebularia*

G. Single birds, New Grounds, May 18 (L.W.H.), July 14 (H.J.B.), Aug. 13 (S. J. Johnstone per H.J.B.), and off Aust Cliff, Oct. 22 (A.E.B., P.J.C., M.T.).

S. One, Yeo Estuary, Aug. 13 (W.L.R.).

GOLDEN PLOVER *Pluvialis apricaria*

S. 110, Lansdown, Mar. 9 (F.L.B.). Lulsgate aerodrome : 100 or more, Oct. 28, 30 (G.G.C., M.T.) ; 80, Nov. 5 (G.G.C.) ; and 250, Dec. 3 (G.G.C., C.A.L.W., F.W.).

GREY PLOVER *Squatarola squatarola*

S. Two, Brean Sands, Nov. 12 (R.H.P.) ; four, Yeo Estuary, Dec. 10 (W.L.R.) ; and seven, Clevedon, Dec. 26 (G.C.W.W.).

LAPWING *Vanellus vanellus*

S. Lulsgate aerodrome : approx. total of 1000, Oct. 28 (G.G.C.). Continuous southerly movement, Cheddar res., Dec. 10, when at least 2000 (in parties of 50 or more) passing over period of three hours. Hard weather a few days later (B.K.).

OYSTER-CATCHER *Haematopus ostralegus*

G. Two, New Grounds, Aug. 13 (S. T. Johnstone per H.J.B.). One, Severn Beach, Sept. 16 (A.C.L.), Dec. 31 (P.J.C.).

S. Single bird, Blagdon res., various dates, Jan. 22 to Feb. 20 (G.C.B. *et al.*).

BLACK TERN *Chlidonias niger*

G. A number, New Grounds, in May (H.J.B.) ; one, same place, Aug. 7 (L.W.H.). One, Severn Beach, Sept. 17 (H.H.D.).

S. Noted at reservoirs on both passages, and in highest recorded numbers in spring ; 70, Blagdon, May 13, and 46, Cheddar, same date (M.J.W.) ; 11, Barrow Gurney, May 18 (G.E.C.) ; up to 13, Blagdon, various dates, Aug. 6 to Oct. 7 (P.J.C., B.K., A.P.); and up to eight, Cheddar, various dates, Sept. 6 to Oct. 22 (P.J.C., H.H.D., B.K.). Two over flooded fields, Long Ashton, Aug. 30 (R.H.P.).

SANDWICH TERN *Sterna sandvicensis*

S. One, Cheddar res., Apr. 9 ; one, same place, Sept. 17 (B.K.).

COMMON TERN *Sterna hirundo* ARCTIC TERN *Sterna macrura*

G. 86, Common or Arctic, flying north off Severn Beach over period of two hours, May 13 (B.K.) ; 22 off same place, 14th (H.H.D.). Single birds, Common or Arctic, Severn Beach, Sept. 17 (M.T.), and New Grounds, 21st (L.W.H.).

S. Terns, Common or Arctic, reported from reservoirs, several dates in spring, and frequently on return passage, when numbers were greater than those recorded for any previous autumn. Commons and Arctics identified, but species usually not determined. One, Common, Blagdon, Apr. 9—earliest date yet reported for county of Somerset (B.K.). Maximum totals—*c.* 50, Cheddar, Aug. 21 (M.T.), and 35, including at least 9 Arctics, same place, Sept. 17 (B.K.). Arctics also noted—one, Blagdon, Aug. 27 (P.J.C., R.H.P.), Sept. 17 (B.K.) ; two, Cheddar, Sept. 24 (H.H.D., B.K.). Of eight, viewed with telescope at close range, Cheddar, Sept. 25, five were Commons and three Arctics (P.J.C.).

LITTLE TERN *Sterna albifrons*

S. Four, Cheddar res., May 13 (M.J.W.) ; one, perhaps others, same place, Aug. 21 (M.T.). Single bird along tideline, Weston-super-Mare, Sept. 18 (G.C.S.I.).

SABINE'S GULL *Xema sabini*

S. Remains, chiefly wings, tail and legs, of immature bird (evidently storm-driven), Cheddar res., Sept. 24 ; identification confirmed at Edward Grey Institute. First record for the district for over 50 years (B.K., H.H.D.).

BLACK-HEADED GULL *Larus ridibundus*

S. Roosting in great numbers at mouth of Avon in Dec. ; total estimated at over 11,000 on 23rd (R.H.P.).

LESSER BLACK-BACKED GULL *Larus fuscus*

G. and **S.** Single birds, perhaps of the Scandinavian form (*L. f. fuscus*) reported from the Avon at Bedminster Bridge, Sept. 19, 22 (P.J.C.) and from Hotwells, Nov. 18 (B.K.).

GLAUCOUS GULL *Larus hyperboreus*

G. The following immatures reported—one, Severn Beach, Jan. 8 (H.D.); one, New Grounds, various occasions, Feb. 8 to Apr. 19 (H.J.B., P.S. *et al.*); one on Avon, nr. Bedminster Bridge, several occasions, Feb. 15 to Mar. 3 (P.J.C., M.T.); and one, probably same, at City Docks, also on Mar. 3 (R.H.P.).

S. One, Bedminster Bridge (cf. above).

KITTIWAKE *Rissa tridactyla*

S. Cheddar res.—four (one dead), Feb. 14; three still present on 19th, and what may have been same three were found dead, 26th (B.K.). One, same place, Sept. 25 (P.J.C.). Five, 2 ads., and 3 imms., off landing beach, Steep Holm, Apr. 10 (R.H.P., M.J.W.).

GUILLEMOT *Uria aalge*

S. One close off Steep Holm, Apr. 10, 11 (R.H.P., M.J.W.).

LITTLE AUK *Alle alle*

S. Single, storm-driven birds found dead—Blagdon res., Feb. 11 (Bristol Waterworks Co. per H.H.D.), 20 (M.J.W.); Cheddar res., Feb. 12, and Nyland, same date (B.K.); Tickenham, Mar. 11 (Mrs. C. I. Sandwith per W.R.T.). One found alive, Woodspring Priory, Feb. 11 (W.L.R.).

CORN-CRAKE *Crex crex*

G. Single birds in corn crops, Little Stoke, Aug. 16, 31 (H.H.D.), and Dyrham, 31st (F.L.B.).

S. One frequently heard, Tickenham, May–June (G.E.C).

WATER-RAIL *Rallus aquaticus*

S. One, Barrow Gurney (old res.), Jan. 14, 21 (B.J.B., P.J.C., M.J.W.), and up to four, various dates, Jan.–Feb. (R.A.S.). Single bird, Blagdon res., Apr. 28 (W.L.R.).

COOT *Fulica atra*

S. 2,000, largest total yet, Cheddar res., Jan. 31 (B.K.).

RED-LEGGED PARTRIDGE *Alectoris rufa*

G. One, Little Stoke, Aug. 7 (H.H.D.). Two, Lower Almondsbury, Sept. 23 (R.M.).

QUAIL *Coturnix coturnix*

G. Two reported, Wick, early Aug. (F.L.B.).

LEPIDOPTERA NOTES, BRISTOL DISTRICT, 1950

By C. S. H. Blathwayt, M.A., F.R.E.S., Hon. Sec. of the Entomological Section

Compiled from Reports of Members of the Section

(*Received Jan. 26, 1951. Read in title at General Meeting, March 1, 1951*)

THE month of January, 1950, was unusually dry; the first part being mild but the last two weeks very cold, with severe frosts.

February was very wet and mild and March was a dry and fairly mild month on the whole, and the Sallows began to come into bloom during the first two weeks. April was much wetter than usual and quite exceptionally cold with some heavy snow during the last ten days. May provided several fine days but also some very unsettled weather but June was an exceptionally fine and warm month.

The months of July, August and September must have been the wettest for many years and a complete contrast to the same months of the previous year.

October was generally dry with some very fine days but collecting at Ivy was disappointing on the whole.

November was again exceptionally wet and the year concluded with a cold December.

There is no doubt that 1950 was a very bad year for the Lepidopterist, due mainly to the exceptionally poor Summer. Many species which were common in 1949 were rare in 1950 and this applied particularly to the *Lycaenidae*, but, on the other hand, some species like *Melanargia galathea* and *Maniola tithonus* were particularly abundant.

Perhaps the most interesting occurrences were the discovery of a flourishing colony of *Nonagria sparganii* on the North Somerset Coast and the capture of that great rarity *Daphnis nerii* in Bristol.

The records given below are all from an area of radius of approximately 20 miles from the City and County of Bristol and are selected from notes and information supplied by the following members of the Section :—Messrs. C. L. Bell (C.L.B.), C. S. H. Blathwayt (C.S.H.B.), A. H. Peach (A.H.P.) and K. H. Poole (K.H.P.).

RHOPALOCERA (Butterflies)

Pieris rapae Linn. (Small White). Male taken indoors in Bristol, 6 Jan.—an exceptionally early date and probably accidentally forced (C.L.B.).

Colias croceus Fourc. (Clouded Yellow). A few only this year : 13 May and early Aug. (C.S.H.B.).

Euphydryas aurinia Rott. (Marsh Fritillary). Many larvae taken at Wickwar (Glos.) late Feb. and March (C.L.B. & K.H.P.). Common at Shapwick 20 May (A.H.P. & C.S.H.B.) and Wickwar 29 May (A.H.P., C.L.B. & C.S.H.B.).

Vanessa cardui Linn. (Painted Lady). Fairly common but never abundant. From 31 May.

V. atalanta Linn. (Red Admiral). From 31 May (C.S.H.B.).

Limentis camilla Linn. (White Admiral). Several at Wickwar 1 July (A.H.P., C.L.B. & C.S.H.B.).

Melanargia galathea Linn. (Marbled White). Exceptionally abundant July (C.S.H.B.).

Maniola tithonus Linn. (Gatekeeper). Exceptionally abundant July (C.S.H.B.).

Hamearis lucina Linn. (Duke of Burgundy). Wickwar 29 May (C.L.B. & C.S.H.B.) ; 20 pupae obtained from ova laid by female taken on that date (C.L.B.).

HETEROCERA (Moths)

Herse convolvuli Linn. (Convolvulus Hawk). 27 and 30 Aug. and 2 Sept. Weston-super-Mare (K.H.P.) ; 2 in Sept. Bristol (C.L.B.).

Daphnis nerii Linn. (Oleander Hawk). One taken Ashley Down, Bristol, 29 Oct. and identified by C.L.B.

Macroglossum stellatarum Linn. (Humming-bird Hawk). One taken in an office on the Centre, Bristol, 22 Feb.—an early date (C.L.B.).

Notodonta dromedarius Linn. (Iron Prominent). Larvae at Shapwick 23 Sept. (C.S.H.B.).

Eriogaster lanestris Linn. (Small Eggar). Many emerged from pupae (resulting from larvae taken at Wickwar 6 June, 1949) Feb. and March (C.S.H.B.).

Drepana lacertinaria Linn. (Scalloped Hook-tip). Shapwick 20 May (C.S.H.B.).

Sarrothripus revayana Scop. (Large Marbled Tort). Weston-super-Mare 29 April (C.S.H.B.).

Agrotis vestigialis Rott. (Archer Dart). N. Somerset coast 5 Aug. and 2 Sept. (A.H.P. & C.S.H.B.).

Euxoa tritici Linn. (White-line Dart). As for *A. vestigialis* above.

Amathes sexstrigata Haw. (Six-striped Rustic). N. Somerset Coast 2 and 9 Sept. (A.H.P. & C.S.H.B.).

Eumichtis lichenea Hubn. (Feathered Ranuncule). Late Sept. and early Oct. N. Somerset coast (C.S.H.B.).

Aporophyla nigra Haw. (Black Rustic). As *E. lichenea* above.

Antitype flavicincta Fabr. (Large Ranuncule). As above.

Nonagria sparganii Esp. (Webb's Wainscot). Common in one locality N. Somerset coast in Aug. (C.S.H.B.).

N. typhae Thunb. (Bulrush Wainscot). As *N. sparganii* above.

N. geminipuncta Haw. (Twin-spot Wainscot). As *N. sparganii.*

Coenobia rufa Haw. (Rufous Wainscot). 9 Sept. Clevedon—a late date. (C.S.H.B.).

Arenostola pygmina Haw. (Small Wainscot). 20 Sept. Clevedon (C.S.H.B.).

Rhizedra lutosa Hubn. (Large Wainscot). 21 Oct. Yatton (C.S.H.B.).

Tiliacea aurago Fabr. (Orange Sallow). A few in various places N. Somerset in Sept. and Oct. (C.S.H B).

T. citrago Linn. (Barred Sallow). A few—in various places N. Somerset Sept. and Oct. (C.S.H.B.).

Litophane semi-brunnea Haw. (Tawny Pinion). As *T. citrago* but late Oct. and early Nov. (C.S.H.B.).

L. socia (Pale Pinion). As *L. semi brunnea.*

Scopula immutata Linn. (Lesser Cream Wave). 8 July common Clevedon (C.S.H.B.).

Cosymbia pendularia Auctt. (Birch Mocha). 20 May Shapwick (C.S.H.B.).

Nothopteryx polycommata Hubn. (Barred Tooth-striped). Common March near Bristol (C.S.H.B.).

Ecliptopera silaceata Schiff. (Small Phoenix). 10 Aug. Weston (K.H.P.).

Rhodometra sacraria Linn. (Vestal). One at light near Bristol Oct. (F. J. Stone).

Oporinia autumnata Borkh. (Large Autumnal Carpet). Larvae in N. Somerset May (C.S.H.B.).

Melanthia procellata Fabr. (Pretty Chalk Carpet). 18 June Weston-super-Mare (K.H.P.).

Hydriomena coerulata Fabr. (May Highflier). Abundant in one locality near Clevedon 3 June (C.S.H.B.).

Eupithecia dodoneata Guen. (Oak-tree Pug). 21 April N. Somerset (C.S.H.B.).

Abraxas sylvata Scop. (Clouded Magpie). June N. Somerset (C.S.H.B.).

Ligdia adustata Schiff. (Scorched Silver). 7 July Weston (K.H.P.).

Selenia tetralunaria Hufn. (Purple Thorn). April N. Somerset (C.S.H.B.).

Zygaena palustris Ob. (Marsh Five-spot Burnet). 8 July Clevedon (C.S.H.B.).

A NOTE ON THE LUMBRICIDS FOUND IN THE BRISTOL DISTRICT

By H. Davies

(*Received June 3, 1950. Read in title at General Meeting, March 1, 1951*)

THE following note gives a summary of the occurrence of earthworms of the family Lumbricidae in the Bristol area. It cannot be claimed that the note is the result of an exhaustive search but, as information on the distribution of these animals is scarce and the writer is no longer able to search in the locality, it is thought to be worth while to publish the note in this form.

It will be noticed that Hanham is mentioned as the habitat of certain relatively uncommon species. There is no significance in this other than the fact that a more intensive search has been carried out in this district.

Allolobophora caliginosa (Savigny, 1826) forma *typica*. Abundant throughout the area in all types of habitat.

A. caliginosa (Savigny, 1826) forma *trapezoides* (A. Duges.). This form does not appear to be common in the district, no well-defined specimens being known to the writer.

A. chlorotica (Savigny, 1826). Numerous in all localities. Occurs in at least one Mendip cave, where it was found to be semi-aquatic.[3]

A. terrestris (Savigny, 1826) forma *longa* (Ude, 1885). Generally common over the whole area.

Bimastus eiseni (Levinsen, 1884). Records of a single specimen from a quarry at Hanham.

B. tenuis (Eisen, 1874). May be found in marshy ground near Chewton Mendip, and in some Mendip caves (Eastwater and Goatchurch Caverns[2]). Specimens with and without tubercula pubertatis may be found.

Dendrobaena mammalis (Savigny, 1826). Typical specimens may be obtained at Warmley and Hanham.

D. subrubicunda (Eisen, 1874). Common throughout the area and has been found in Lamb Leer and Goatchurch Caverns.[2]

D. rubida (Savigny, 1826). This species does not appear to be common in the district, the writer obtaining specimens only from woods near Bathford.

Eisenia foetida (Savigny, 1826). Extremely common, usually in or near manure heaps.

Eiseniella tetraedra (Savigny, 1826) forma *typica*. Common in or near streams and ditches throughout the area. Known from various Mendip caves (e.g. Swildon's Hole, Sidcot Swallet, Goatchurch Cavern[2]).

E. tetraedra (Savigny, 1826) forma (?). One specimen from Goatchurch Cavern, Burrington Combe.[2]

Lumbricus castaneus (Savigny, 1826). Apparently common in this district, being found at Warmley, Hanham and Oldland Common.

L. festivus (Savigny, 1826). Occurs in small numbers at Hanham in gardens recently converted from pasture land.

L. rubellus (Hoffmeister, 1843). Numerous in gardens and fields. Has been recorded from G. B. Cavern at Charterhouse.[2]

L. terrestris (Linnaeus, 1785). Plentiful, particularly in cultivated ground throughout the area.

It will be observed that the above list does not include the species *Eisenia rosea* (Savigny, 1826) forma *typica*. This species undoubtedly exists in the area, but specimens from the locality have not come to the notice of the writer.

The nomenclature of the species quoted in this note is that given in Reference 1, *Synopses of British Fauna—Lumbricidae*, published by the Linnean Society of London.

REFERENCES

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TEMPORARY EXPOSURES AND BOREHOLE RECORDS IN THE BRISTOL AREA

VII. JURASSIC ROCKS AT DODINGTON ASH, GLOUCESTERSHIRE

By T. R. Fry

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In August, 1941, a trench about four feet deep was cut up the Cotswold escarpment at Dodington Ash, just south of the lane from Codrington. The strata were well-exposed in the trench on the steepest part of the hill, but towards the base the section was obscured by hill-wash material.

Commencing at the top of the hill about 300 yards south-west of the crossroads at Dodington Ash, the following descending sequence was determined as far as a point at the side of the Codrington road, 440 yards west-north-west of Springs Farm.

Geological Succession

		Thickness ft.	ins.
Upper Fullers Earth (19 ft. plus)	18. Grey, earthy limestone	4	0
	17. Grey marl	6	0
	16. Grey shale with some sandy limestone ...	9	0
Fullers Earth Rock (8 ft.)	15. Grey clay and rubbly limestone which yielded immature *Ornithella bathonica* (Rollier) emend. Muir-Wood and a globose variety of *O. pupa* Muir-Wood	5	0
	14. Grey, earthy limestone which contained *Lima* (*Plagiostoma*) *oepybolus* Whidborne	3	0
Lower Fullers Earth (20 ft.)	13. Grey marl with *Meleagrinella echinata* (W. Smith)	7	0
	12. Grey clay with *Ostrea acuminata* J. Sow., *Wattonithyris* aff. *fullonica* Muir-Wood and *W.* cf. *fullonica* Muir-Wood...	7	0
	11. Greenish-grey clay which provided *Wattonithyris fullonica* Muir-Wood and *W. parva* Muir-Wood	6	0

		Thickness	
		ft.	ins.
Inferior Oolite (25 ft.)	10. Rubbly and earthy limestone with *Zigzagiceras* aff. *pseudoprocerum* (S. Buckman), *Z.* cf. *zigzag* (d'Orb) and *Collyrites ovalis* (Leske)	5	0
	9. Light-grey, somewhat rubbly, oolitic limestone	12	0
	8. Coralline limestone, with some yellowish clay, almost entirely composed of massive colonies of *Isastraea* associated with *Chlamys ambigua* (Münster), *Lima* (*Plagiostoma*) *rodburgensis* Whidborne and *Lopha gregarea* (J. Sowerby) ...	8	0
Cephalopod Bed (5 ft.)	7. Soft, marly, iron-speckled, grey limestone with *Hammatoceras cappucinum* S. Buckman, *H.* cf. *insigne* (Schübler), *Phlyseogrammoceras* aff. *dispansum* (Lycett), *Chlamys ambigua* (Münster), *Entolium demissum* (Phillips) and *Astarte* (*Coelastarte*) *excavata* J. Sow.	5	0
Cotswold Sands (69 ft.)	6. Sand, with hard burrs in upper part; *Astarte lurida* J. Sow. was collected	25	0
	5. Hard bed in sand which yielded *Haugia* sp., *Pseudogrammoceras pachu* S. Buckman and *P.* aff. *subquadratum* S. Buckman	4	0
	4. Soft, micaceous sand ... ... about	40	0
Age uncertain	3. Grey clay, sandy in the upper portion, obscured by hill-wash in places ... ... about	45	0
Lower Lias (16 ft. plus)	2. Grey clay, with thin, limestone bands, from which were collected *Beaniceras* aff *luridum* (Simpson), *Liparoceras cheltiense* (Murchison), *Astarte obsoleta* Dunker, *Chlamys* (*Aequipecten*) *acuticosta* (Lam), *Inoceramus substriatus* Münster, *Mactromya subglobosa* (Tate), *Pholadomya ambigua* (J. Sow.) and *Pleuromya costata* (Young & Bird) about	10	0
	1. Grey Clay with ironstone nodules	6	0 seen

In a nearby locality an exposure of the Cotswold Sand, apparently first recorded by Richardson (1910, p. 91), was seen in the small gully by the roadside between Watts' Barn and Springs Farm where a hard bed, at about the same horizon as No. 5 of the trench section, was recognised and yielded *Haugia* aff. *occidentale* (Haug), *Haugia inaequum* S. Buckman and *Grammoceras thouarsense* (d'Orb.); this assemblage indicates the *striatulum* subzone. *Pseudolioceras gradatum* S. Buckman may point to the presence of the *variabilis* subzone. Other specimens, found in subsoil above the exposure, include *Dumortieria* cf. *multicostata* S. Buckman, and *D. radians* (Reinecke). Richardson also recorded a section of Inferior Oolite at the "Springs" Quarry, which is now much overgrown; rocks of the same general character as beds 9 and 10 of the trench section were present, and, from evidence adduced from specimens collected from rubble on the hillside opposite the quarry, Richardson was of the opinion that both the Upper Coral Bed and Upper Trigonia Grit were also present.

CONCLUSIONS

The following comparisons are made with other localities, particularly with the Sodbury Tunnel sections about 2 miles to the north (Reynolds and Vaughan, 1902).

i. The thicknesses of the Upper and Lower Fullers Earth are almost certainly reduced by slipping or cambering.

ii. The Inferior Oolite is remarkably thin, 25 ft. in the trench as against about 55 ft. at Old Sodbury (Richardson, 1910, p. 93). The most striking feature is the absence of the Upper Trigonia Grit, which might have been expected immediately below bed 8, and no trace of it was found either in the trench or upon the nearby hillsides ; it is usually present in the Bath-Cotswold region and was found in the Sodbury Tunnel. The Upper Coral Bed is unusually well-developed and similar in character to that of Dundry Hill.

iii. The thickness of 5 ft. for the Cephalopod Bed is half that recorded from the Sodbury Tunnel ; probably only the lower portion, belonging to the Dumortieria and Dispansum Beds is present (but see iv, below).

iv. The difference in thickness of the Cotswold Sands of 69 ft. in the trench as compared with 185 ft. estimated for the Sodbury Tunnel may only in part be explained if bed 3 is included in the Cotswold Sands. Bed 5 belongs to the *striatulum* subzone, and its position 25 ft. below the Cephalopod Bed is noteworthy because a similar fauna is found at the base of the Cephalopod Bed at Wotton-under-Edge.

v. No representatives of the lower zones of the Upper Lias were proved in the trench, although about 10 ft. of strata belonging to the *bifrons*, *commune*, and *falcifer* zones have been recorded from the Sodbury Tunnel.

vi. No trace of the marlstone was found although this horizon was penetrated by the Sodbury Tunnel, but in view of the structures known to occur along the escarpment, its absence may be due to faulting or to superficial movement.

I wish to express my gratitude to Dr. L. R. Cox, Dr. W. J. Arkell and Mr. D. T. Donovan who have greatly assisted me by naming some of the lamellibranchs and ammonites.

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FLUORITE FROM THE CARBONIFEROUS LIMESTONE OF THE AVON GORGE, BRISTOL

By I. S. Loupekine, B.Sc., F.G.S.

(*Received, March 29, 1951. Read in title at General Meeting, March 1, 1951*)

Introduction

About a hundred years ago the Avon Gorge was apparently the best known locality for fluorite in the Bristol district. Curiously, the occurrence has never received detailed description and no records appear to have been made in recent years, for Kingsbury (1939) remarked that "Although small amounts of fluorite were recorded many years ago from the Avonian Limestone of the Avon Gorge at Clifton, it does not appear to have been found there again. . . ." In March, 1948, the writer was fortunate to rediscover the mineral in the Avon Gorge limestones, and the present account contains a description of about 200 crystals which were collected from the Great Quarry, Gloucestershire side of the Avon, and of about 6 specimens which were obtained from Quarry 2, Somerset side of the Avon.* Notes on specimens in the British Museum (Natural History) are appended in an attempt at presenting a fuller account.

Historical Account

The first record of fluorite in the limestones of the Avon Gorge appears to have been that of Richard Bright who, in a paper read before the Geological Society of London in 1811 (Bright,

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* The nomenclature of the quarries referred to in this paper follows that of Vaughan (1905).

1817), noted, with reference to the limestone of the Black Rock Quarry (Gloucestershire side), that " in its cavities are found dog's-tooth spar, cubes of purple fluor, acicular crystals of sulphate of strontian, and of oxide of iron ". Bright further recorded that " similar cavities " occurred in the rocks of the Great Quarry, but he did not make it clear if fluorite was to be found there also. However, a specimen presented to the British Museum (Natural History) (B.M. 47080) by Benjamin Bright (Richard Bright's grandson) in 1873, which originated, there is little doubt, from the Great Quarry, supports the belief that fluorite was known from that quarry at an early date. Two other specimens (B.M. 41438, acquired from J. Owen in 1868; B.M. 44019, acquired from the Rev. F. B. Day in 1871) were obtained, in all probability, from the same locality.

Stoddart (1869) stated that " between the beds of limestone [in the Great Quarry] are often seen small cubes of fluor spar ". A similar statement was made later (1875), accompanied by a plate on which fluorite is not precisely localised (the word ' Fluor Spar ' being inserted about the middle of the quarry).

Grenfell (1873) recorded fluorite " in small blue or purple crystals in sparry cavities in Carboniferous Limestone ; Black Rock and Great Quarry, Avon section ".

According to Perceval (1873), " Fluor spar occurs at Clifton, in the Great Quarry on the Gloucestershire side of the Avon, in the form of small purple cubes, in cavities of the Mountain Limestone, lined with crystals of Calcite and occasionally of Pearl spar ". He further recorded the mineral from " the Somersetshire side of the Avon section ", presumably in Quarry 4. Two of Perceval's specimens were presented to the Bristol Museum (D. 725 and D. 1996), but they were destroyed in an air-raid in 1940. Records show, however, that the fluorite was contained in geodes which were obtained from the Great Quarry.

The most recent reference is that by Dr. Stanley Smith (1943) who noted that " Fluorite, although not entirely absent, is very uncommon in the limestones of the Avon Gorge ". In a personal communication, Dr. Smith stated that he recollected having seen yellowish crystals, possibly fluorite, on a mineralised surface in the S_2 cliffs below the Suspension Bridge, Gloucestershire side. The occurrence of fluorite in the S_2 sub-zone is supported by Reynolds and Vaughan (1911) who, in discussing brecciation in a bed toward the bottom of S_2 in Burrington Combe, observed " that there are signs of disturbance accompanied by the occurrence of unusual minerals—in this case fluor, at the corresponding horizon in the Great Quarry of the Avon section ".

DESCRIPTION OF RECENT FINDS

Fluorite was found to occur in the Great Quarry, Gloucestershire side of the Avon, in limestones of the S Zone of the Avonian Series, and in Quarry 2, Somerset side of the Avon, in limestones of the Z Zone. Search for fluorite was made elsewhere in the Avon Gorge, particularly in the Black Rock Quarry (opposite Quarry 2) and in Quarry 4 (opposite the Great Quarry), but without success.

(1) GREAT QUARRY : S ZONE

Fluorite occurs at several horizons in the upper division of the S_1 sub-zone in the northern part of the quarry. The mineral is present sparingly except in a 1½ foot thick band where it is relatively common. This fluorite-rich band is to be found near the top of the 6 ft. bed referred to by Reynolds (1921q) as 'China-stone, with algal layers and pale dolomite'. The band is situated from 5 to 6 feet above the level of the 'Trilobite Bed' which is itself 4 ft. above the prominent 'Front Slope'. The fluorite-rich band is thus almost exactly midway in the S_1 (b) sub-zone. Owing to its greater importance, it will be described in fuller detail than the remaining occurrences.

(a) FLUORITE-RICH BAND

The fluorite-rich band, which is a strongly dolomitised limestone, can be readily detected in the field by its ochreous-yellow-weathered colour and its geodal or nodular character. The band can be traced to the top of the quarry, but only the lower 100 ft. of the bed are readily accessible. The bed is strongly brecciated and veined, many of the veins trending parallel to the bedding. There are several, small, reversed faults, and stylolitic structures are developed mainly parallel to the planes of the reversed faults. Fault- and shear-zones are often accompanied by fault-breccia, red staining, crystallisation of calcite, and deposition of chalcedony. The occurrence of bituminous substances along joint-planes and as seepages over portions of the quarry face is a common feature.

The lithology of the S_1 (b) beds has been described by, among others, Stoddart (1875), Vaughan (1905, 1906), Reynolds (1921g, 1921q) and Vaughan & Reynolds (1936). Special features were recorded by Wethered (1888) and Chapman (1912). Further details of the lithology of the fluorite-rich band are given in Table I. The overlying beds, separated by a shaly parting, are massive, fossiliferous limestones, with a partly dolomitic matrix (Fig. 1) ; the immediately underlying bed is a brown-weathering, granular, algal limestone with a strongly dolomitic matrix, particularly in the upper part where a few veins and geodal infillings are to be found.

TABLE I

Lithological Character of the Fluorite-rich Band

		Thickness	
		ft.	ins.
Shaly parting, succeeded by massive limestone			
FLUORITE-RICH BAND	Fine-grained, compact, dark-grey, shelly, foraminiferal limestone, weathering brown. Micro-sections show the presence of much detritus such as angular quartz-grains. Crinoid ossicles are abundant, and growths of pyrite are present. Geodes are developed to a limited extent ...	0	4
	Compact, grey, fine-grained, dolomite-rock, weathering to a porous rock of ochreous-yellow colour, reddish in places. Micro-sections show that it is strongly dolomitised on a finely granular scale, the matrix consisting of small rhombohedra of dolomite with sparse quartz-grains. Calcite and dolomite geodal infillings are abundant, especially in the central part. Calcite and dolomite veining and pool accumulations are equally prominent	1	0
	Grey to brown calcitic mudstone, weathering to an ochreous-yellow, porous rock. Micro-sections show that the rock is dolomitised on a finely granular scale. Geodal infillings and veins and veinlets of dolomite and calcite are present. A peculiar nodular structure, recalling a large-scale stylolite, originates by weathering ...	0	3
Algal limestone			

The vertical limits of distribution of the fluorite are shown in Fig. 1. The fluorite is thus concentrated in the central 12 inches of the fluorite-rich band. Fig. 1 also shows the relationship between fluorite content and degree of dolomitisation of the limestones. The percentage of dolomite was estimated by means of the potassium ferricyanide test described by Steidtmann (1917) and modified to the treatment of powdered rock held on a filter paper. The resulting colours were compared with standards, and the validity of the method was checked by x-ray diffraction powder analysis and the immersion method of refractive index determination.

Fluorite is to be found in both geodal infillings and in veins and veinlets. There is no sharp demarcation between the two types of infillings, for one type passes into the other. The infillings may be considered in two main sets : an earlier set in which dolomite is usually an important constituent, and a later set in which calcite is essentially the only carbonate mineral developed. In the majority of cases, fluorite is associated with infillings of the former set.

Geodal infillings (some of which are true geodes) vary in size, reaching 16 × 7 cm. in vertical section. They may be spherical, but are usually ellipsoidal, with the longest dimensions generally in the plane of the bedding ; some may be angular or irregular

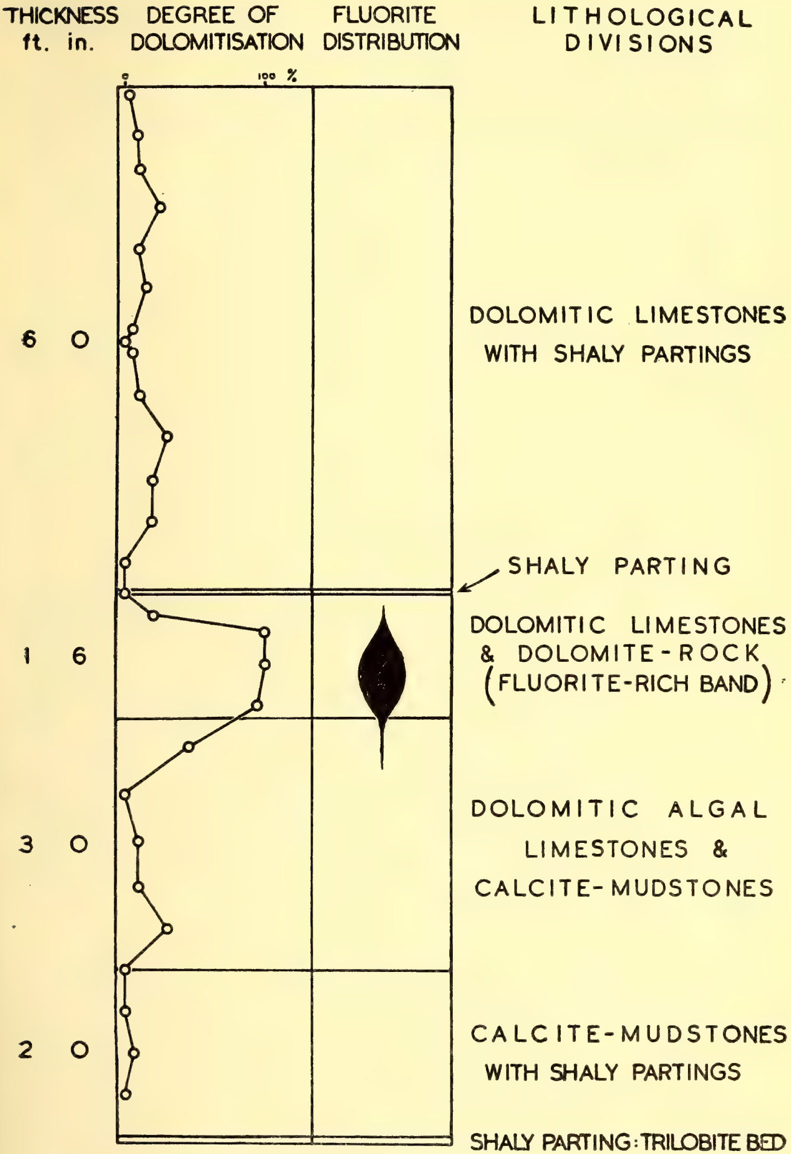
THICKNESS ft. in.
DEGREE OF DOLOMITISATION
FLUORITE DISTRIBUTION
LITHOLOGICAL DIVISIONS
0
100 %
6 0
1 6
3 0
2 0
DOLOMITIC LIMESTONES WITH SHALY PARTINGS
SHALY PARTING
DOLOMITIC LIMESTONES & DOLOMITE-ROCK (FLUORITE-RICH BAND)
DOLOMITIC ALGAL LIMESTONES & CALCITE-MUDSTONES
CALCITE-MUDSTONES WITH SHALY PARTINGS
SHALY PARTING: TRILOBITE BED

FIG. 1

RELATIONSHIP BETWEEN DEGREE OF DOLOMITISATION AND FLUORITE DISTRIBUTION IN A PORTION OF THE S_1(b) SUB-ZONE, GREAT QUARRY in outline. Veins and veinlets range from a fraction of a millimetre to 3 cm. in width. In many veins, angular fragments of limestone are to be found isolated.

The mineral content of the geodal infillings and of the veins and veinlets is as follows. The generalised paragenetic sequence is shown in Fig. 2.

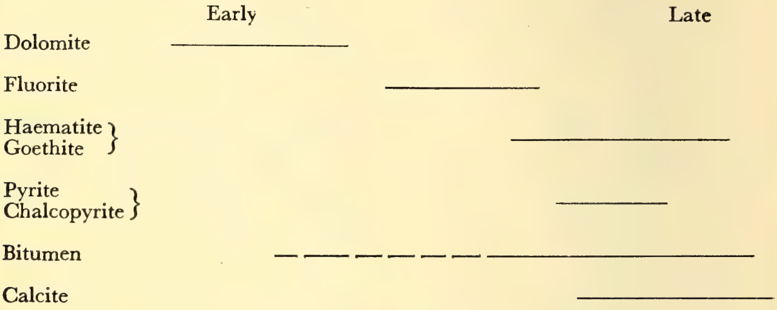

Fig. 2. GENERALISED PARAGENETIC SEQUENCE OF GEODAL AND VEIN IN-FILLINGS, FLUORITE-RICH BAND.

1. *Dolomite.* The walls of the cavities are lined with a granular development of finely crystallised, sub-transparent dolomite of white to yellowish or brownish colour. The zone is usually 1 to 3 mm. thick, and, on freshly fractured surfaces, the pearly lustre and curved cleavage planes are displayed. Occasionally, larger rhombohedral crystals may be developed, showing curved faces. The refractive indices of the dolomite vary from ω 1.685, ϵ 1.504 to ω 1.677, ϵ 1.500. Under the microscope, the dolomite is seen to be usually turbid owing to the presence of minute inclusions, some of which are fluffs of iron hydrates. The marginal dolomite and its rhombohedral habit are shown on Pl. 1, Figs. 1–3 and Pl. 2, Fig. 1.

2. *Calcite.* Calcite is always later than the dolomite and rests on a crystallised surface of the latter. It usually fills the central portions of the geodes, but may occasionally be lacking in part or even wholly. If space has allowed it, the central calcite may show the development of crystal faces, and a complex habit may be attained, involving several sets of scalenohedra and rhombohedra. The calcite is coarsely crystalline, forming either a single mass or a number of large, mutually interfering plates. The mineral is vitreous, translucent to transparent, and it is usually colourless, although it may be stained brownish, especially in the larger geodes and veins. The brown colour is probably due to disseminated bitumen, as is indicated by yellow fluorescence. Glide-lamellae

are often present, especially in the large, single masses, which appear bluish. The calcite has the normal refractive indices and is shown on Pl. 1, Fig. 1 and Pl. 2, Fig. 1.

The proportion of calcite to dolomite is related to the size of the geode or vein—small geodes and veins are composed mainly of dolomite and large ones mainly of calcite.

On fresh surfaces the distinction between the calcite and the dolomite is not immediately apparent, but on weathered surfaces the two minerals are brought into contrast by the fact that, whereas the calcite has remained vitreous in appearance, the dolomite has become opaque and white. Furthermore, the dolomite stands out in relief owing to its superior hardness not only to the calcite but also to the matrix of the rock. Apart from ordinary etching with dilute hydrochloric acid, staining with potassium ferricyanide and with silver chromate (Twenhofel & Tyler, 1941) proved useful in distinguishing the two minerals in the laboratory. The ordinary Lemberg's test failed in many instances owing to the great variation existing in the relative porosity and state of division of the two carbonate minerals.

3. *Fluorite.* Although a few fluorites have been observed in the larger geodes and veins and a few in the smaller geodes and veinlets, the majority of specimens were seen in infillings of moderate size (about 1 to 2 cm. in diameter). Only a small proportion of the geodal and vein infillings contain fluorite.

The fluorite occurs typically in cubes up to 5 mm. across the faces. The cubes are either single individuals or form interpenetrant groups (compare Pl. 1, Figs. 5–6 with Pl. 1, Figs. 2–4). Parallel growths and distortions are sometimes displayed. The cube $\{100\}$ is the characteristic form present, but a few crystals have small modifications of the tetrahexahedron $\{hk0\}$ near $\{310\}$ (Pl. 1, Fig. 4), which in rare cases may become dominant over the cube (Pl. 1, Fig. 2). Other forms are rare. The $\{100\}$ faces are lustrous, but may show etch-figures and growth-marks; the $\{hk0\}$ faces are usually dull and pitted.

In all cases the fluorite crystals rest on the dolomite, and many are moulded round the dolomite crystals (Pl. 1, Figs. 1–3). In those cases in which the fluorite attempted to crystallise between the crystals of dolomite, the fluorite is devoid of crystal faces. This is particularly to be seen in the veins, where room for crystallisation was, in general, more limited than in the geodes, and thus the fluorite may here occur as specks, grains and irregular growths. The fluorite always exhibits good crystal faces against the calcite, so the order of crystallisation is invariably (1) dolomite, (2) fluorite, (3) calcite. This relationship makes the "working out" of crystals of fluorite by means of weak acid an easy matter.

The fluorite shows great variation in colour, not only from specimen to specimen, but also sometimes within the same crystal on account of zoning (Pl. 1, Fig. 6). The colours observed ranged from colourless to nearly black through various shades of pink, blue, and purple. Variations in the colour were in some cases due to apparent factors such as differences in the size of the crystals, the background mineral association, the state of cleavage, and the presence of inclusions; but in most cases the colour differences were real. It was noticed that, whereas specimens on weathered surfaces were often pale and pink in colour, the specimens obtained from freshly opened geodes were usually dark and of blue colour. This change may be connected with exposure to sunlight, which was shown by Brown (1932) to be a possible factor in the decolorisation of certain fluorites. The reason for the colour differences is, however, not known. Tests with a Geiger counter and exposures to Nuclear Research Plates gave negative results. The fluorite was neither photo- nor thermo-luminescent, except where contaminated by bituminous material which imparted a patchy, yellow fluorescence in a few specimens. Preliminary qualitative spectrographic analyses of small quantities of the pink and blue varieties showed the presence of traces of Ca, Mg, K, Al, and Fe equally in both samples. It seems, therefore, that the colour variation may be due to differences in the structural states of the same elements. In zoned crystals the alternating darker and lighter layers are disposed parallel to the $\{100\}$ planes, even if the crystallography is mainly the tetrahexahedron (Pl. 1, Fig. 2).

In a number of crystals of fluorite there are numerous inclusions, usually near the surface and disposed in planes parallel to the $\{100\}$ faces. The inclusions are spherical or disc-shaped, are of red or black colour, and measure 0.02 to 0.04 mm. in diameter (Pl. 1, Fig. 5). Spectrographic analysis of a fragment of fluorite rich in these inclusions gave relatively strong traces of iron, and x-ray analysis proved the presence of haematite and goethite. Some of the red spheres appear to be hollow and there are also rings of the same material which, measuring about 0.15 mm. in diameter, perhaps mark the positions of former attachments of hemispheres or are due to " colloidal drops ".

4. *Goethite and haematite.* In addition to the inclusions in the fluorite, red and black specks occur in a number of geodes, either attached on the faces of crystals of calcite or embedded in them. The red material forms brilliant plates up to 0.4 mm. in length and spherulitic growths attaining 0.1 mm. in diameter; the black material forms shiny spherulites also attaining 0.1 mm. in diameter. These specks, which may be seen on Pl. 1, Fig. 1, are similar to those described by Kingsbury (1941) as goethite and haematite.

A number of the black spherulites were collected for x-ray diffraction analysis, which showed strong lines of haematite with faint goethite lines. The black spherulites yielded a red powder on crushing, and it is possible that the goethite forms only a coating on the haematite.

5. *Chalcopyrite and pyrite.* Brilliant or iridescent grains and crystals of chalcopyrite, below 0.5 mm. in size, are to be found in a few geodes in the calcite or sometimes on the faces of crystals of fluorite (Pl. 1, Fig. 4). In the veins, the chalcopyrite forms irregular groups and wiry growths which are markedly iridescent. Specks of pyrite also occur in the geodes and veins.

6. *Bitumen.* There are blebs of a yellow-brown or red-brown to black colloform substance present in many geodal and vein infillings which may entirely fill the central cavity (Pl. 2, Fig. 1). Two main varieties are present. (1) Yellow-brown to deep red-brown substance, soft, fluidal and plastic to brittle. The more compact varieties are brittle and have a smooth texture, a shiny to velvety lustre, and a conchoidal fracture. The substance is translucent and isotropic, but contains birefringent inclusions which x-ray diffraction analysis has identified to be mainly calcite, dolomite, and quartz. The refractive index $n_D^{20°}$ ranges from 1.541 to 1.558. The average specific gravity (uncorrected for the inclusions) at 18°C is 1.17. The substance is often closely associated with the fluorite and may partially penetrate the outer layers (Pl. 2, Fig. 2), but may occur interstitially between the calcite grains or may accumulate in pockets (in Pl. 1, Fig. 1, a speck of the substance is shown in the upper left-hand corner of the geode). The substance is strongly and densely fluorescent in yellow; the fluorescence is quenched on heating and is irreversibly lost at 230–240°C. The material softens at about 270°C and melts into a globule not far above 320°C and burns with a quiet flame. The substance is slightly soluble in carbon disulphide and in tri-chlorethylene, and the fluoresence can be destroyed by boiling in pyridine and nitrobenzene. At least two components were detected chromatographically. (2) Black substance, fairly soft, brittle, with a conchoidal fracture, smooth texture and brilliant lustre. It is opaque even when finely powdered and examined under the microscope. The average specific gravity at 18°C is 1.30. The substance is to be found usually interstitially between the calcite grains (Pl. 2, Fig. 1), but may also be associated with the dolomite. The substance is infusible, not fluorescent, and practically insoluble in carbon disulphide and other organic solvents.

The two substances are often mixed together, and do not represent the only varieties. Thus a third substance, which is of dark-brown colour, is both fluorescent and fusible, but largely soluble in carbon disulphide ; other varieties show intermediate properties. The organic nature of these complex substances is confirmed by the results of micro-chemical analyses listed in Table II. In addition, tests for nitrogen and sulphur were carried out by Miss V. Boarland, Department of Organic Chemistry, University of Bristol, who identified both elements in the red-brown and black substances. X-ray powder photographs of the substances showed a general similarity with diffraction patterns of asphalts figured by Williford (1943) and of bitumens from several localities (for example, Derbyshire, Shropshire, Ravencraig).

TABLE II

Microchemical Analyses of Bitumens, Avon Gorge

(Analysts : Drs. G. Weiler & F. B. Strauss, Microanalytical Laboratory, 164 Banbury Road, Oxford)

	Red-brown substance (fusible ; largely insoluble in CS_2)	Black substance (infusible ; largely insoluble in CS_2)
C ..	81.97	89.03
H ..	5.45	2.67
Ash ..	3.69	0.34
O, N, S, etc. (by difference) ..	8.89	7.96
Total	100.00	100.00

The various organic substances that have been described may be considered provisionally under the general term of ‘ bitumen ’. The black, infusible substance which is largely insoluble in carbon disulphide appears to be an asphaltic pyrobitumen according to Abraham's classification (1945). Similarly, the dark-brown, fusible substance which is largely soluble in carbon disulphide appears to be a true bitumen. On the other hand, the red-brown fusible substance which is only slightly soluble in carbon disulphide does not fit into Abraham's system, but seems to be allied to asphaltite.

(b) Horizons above and below the Fluorite-rich Band

Fluorite has been found at horizons both above and below the fluorite-rich band. Outside this band, geodal infillings are scarce, and fluorite occurs mainly in the veins and veinlets of calcite or dolomite. Two sets can be distinguished: an early set in which dolomite is a prominent constituent, and a late set in which dolomite does not occur.

The early veins cut strongly dolomitised bands and have a variable orientation relative to the bedding. Fluorite occurs as thin streaks and disseminations which are set in granular dolomite in association with chalcopyrite and black bitumen (Pl. 2, Fig. 3). The fluorite is generally of purple colour and is not fluorescent. The order of deposition is variable; dolomite and fluorite are early constituents; chalcopyrite is a late one; bitumen may be both early and late.

The late veins roughly follow the bedding and were almost certainly the ones alluded to by Stoddart (1869, 1875). Fluorite is found crystallised in cavities between crystals of calcite which commonly develop the scalenohedral habit, and is associated with brown, bituminous staining, blebs of black bitumen, and small crystals of white barite which encrust the crystals of calcite and fluorite. The fluorite, which is of cubic habit, occurs in several shades of purple and lilac, and occasionally displays the zonal arrangement. The order of deposition is (1) calcite, (2) fluorite, (3) barite and bitumen.

(2) QUARRY 2: Z ZONE

Fluorite was found sparingly in calcite pools measuring about 4 × 3 cm. in cross-section on the north face of the quarry in limestones of the lower part of the Z_2 sub-zone. The rock is a shelly, crinoidal, dark-grey limestone of 'petit granit' type (Reynolds, 1921q) in which the matrix is dolomitised.

The main infilling mineral in the cavities is calcite; other minerals that may occur are quartz, dolomite, iron oxides, bitumen and fluorite. The calcite, which is usually of white colour, but may be stained by ferruginous or bituminous materials, is coarsely crystalline and may occasionally develop the scalenohedral habit. Quartz may occasionally be present, but is more characteristic of cavities in the underlying sub-zone: it is of greyish-white colour and is often developed into crystals which have the pyramidal terminations. Dolomite, which occurs in small amounts, is finely granular to rhombohedral in form and of brownish colour. Iron oxides, in the form of haematite and limonite, occur as specks in many geodes. Bitumen is of black to brown colour and is generally non-fluorescent, but some yellow-fluorescing specks in the calcite may be another variety of bitumen.

Fluorite is developed as grains or crystals displaying the cubic habit. The colour ranges from nearly colourless to dark mauve, but another variety is of pale-brown colour and may be mistaken for stained calcite. The fluorite is not luminescent.

Owing to there being insufficient material available for examination, the relationship between the minerals could be studied only on a limited scale. The sequence of deposition seems to have been (1) dolomite, (2) quartz, (3) calcite, (4) fluorite, (5) iron oxides and bitumen, (6) calcite (second generation).

Notes on specimens in the British Museum (Natural History)

Three specimens of fluorite in the mineral collections of the British Museum (Natural History) are thought to be either certainly or very probably derived from the Carboniferous Limestone of the Avon Gorge.

(1) B.M. 44019. Specimen purchased from F. B. Day, 1871. An old label on the specimen reads : " Cubic Fluor /purple /finest known /rare /Clifton /Avon ". The register entry also gives : " From a quarry on the Gloucestershire side of the Avon ". The specimen is a portion of a large geode (which measured at least 10 × 6 cm.) set in a dark, brownish-grey, dolomitised limestone, somewhat crinoidal and containing a colony of *Lithostrotion.* Dr. Stanley Smith, who examined the matrix, identified the latter as *L. martini*, and had no doubt that the provenance was the S beds of the Carboniferous Limestone Series. There can be little doubt that the specimen was obtained from the Great Quarry.

The lining of the geode consists essentially of white, colourless or brownish calcite which attains the typical scalenohedral habit and contains plates and spherical growths of haematite and goethite. Occurring between, and partly overgrown by, the crystals of calcite, there are present several cubes of brown to deep-violet fluorite, measuring up to 15 mm. across the faces, and blebs of black, opaque, non-fluorescent bitumen.

The fluorite occurs in single and interpenetrant cubes, showing small $\{hk0\}$ truncations. The large $\{100\}$ faces are drusy and etched, and may carry minute plates of calcite as orientated overgrowths. Whereas the violet fluorite is not fluorescent except in spots which appear to be due to impurities, the brown fluorite, which forms cores, is fluorescent in a strong canary-yellow. This may be due to an impregnation of a luminescent variety of bitumen, which may also account for part of the yellow to orange-yellow fluorescence in the calcite.

The mineral composition and distribution in this specimen and in the geodes from the fluorite-rich band in the Great Quarry are comparable.

(2) B.M. 41438. Specimen purchased from J. Owen, 1868. An old label on the specimen reads " Nr. Bristol ". The specimen

is part of a large geode (which measured at least 9 × 5 cm.) set in a compact, dark, brownish-grey, dolomitised limestone which in places passes into "china-stone". Dr. Stanley Smith, who examined the specimen, had little doubt that the rock characterises the S beds of the Carboniferous Limestone Series. The rock-matrix is similar to some of the types which occur in the lower part of the S_2 sub-zone in the Great Quarry, and it is highly probable that that was the provenance of the specimen.

The lining of the geode consists essentially of brownish, white or colourless calcite of several generations and showing the scalenohedral habit. Several crystals of fluorite of cubic habit which measure up to 12 mm. across the faces rest on, and are partly overgrown by, the calcite. Finally, blebs of black to red-brown, non-fluorescing bitumen rest on both the fluorite and calcite and are in places covered by specks or films of pinkish-brown clay, possibly illite.

The fluorite occurs in cubic crystals with small $\{hk0\}$ truncations. The $\{100\}$ faces are extensively pitted on a small scale and display reëntrant $\{hk0\}$ facets. Colour-zoning is pronounced, the centres being of brown colour and the outer layers of purple to blue-purple colour. Whereas the violet fluorite is not sensitive to ultra-violet radiation, the brown fluorite fluoresces in a strong yellow, which may be due to the presence of impurities of a luminescent bitumen.

The correspondence in the mineral composition and distribution between this specimen on the one hand and B.M. 44019 and the geodes from the fluorite-rich band on the other confirms the conclusion that it was probably derived from the Great Quarry.

(3) B.M. 47080. Specimen from the Benjamin Bright collection, 1873. The label reads "Near Bristol". The matrix is a dark, brownish-grey, compact, dolomitised limestone, and the rock contains a geode which measures about 10 × 6 cm. The lining of the geode consists essentially of white, colourless or brownish calcite of scalenohedral habit. Fluorite, in cubes measuring up to 10 mm. across the faces, is deposited between two generations of calcite. Finally, investing both the fluorite and calcite, are aggregates of finely divided red to brown ferruginous matter associated with small, whitish crystals of barite and rhombohedra of dolomite or siderite.

The fluorite occurs in single and interpenetrant cubes, some of which are in parallel growth. The colour is either brown or violet: some crystals may be wholly brown; others wholly violet; and others have brown cores surrounded by violet outer zones. The brown variety is strongly fluorescent in canary-yellow, but the violet variety is not sensitive to the ultra-violet radiation.

Dr. Stanley Smith, who examined the specimen, had little doubt that it was derived from the S beds of the Carboniferous Limestone Series. The similarity between this specimen and the two described above is close, and it probably originated in the Great Quarry.

Summary and Conclusions

The occurrence and general paragenesis of fluorite in the Carboniferous Limestone of the Avon Gorge are described, and the early records of Bright, Stoddart and others are confirmed. The fluorite localities are (1) the Great Quarry, Gloucestershire side of the Avon (S Zone); (2) Quarry 2, Somerset side of the Avon (Z Zone). The latter locality appears to be a new one. No fluorite has been found in the remaining fluorite localities previously recorded in the literature (Quarry 4, opposite the Great Quarry; Black Rock Quarry, opposite Quarry 2), but there is no doubt as to its existence at both localities. Particular attention should be paid to the northern part of the Black Rock Quarry where calcite pools are fairly abundant.

Fluorite occurs sparingly in the Avon Gorge limestones; a $1\frac{1}{2}$ ft. thick band in the Great Quarry, which is taken to be the best collecting horizon, is estimated to contain no more than 1 part of fluorite in 10,000. The habit of the fluorite is mainly the cube $\{100\}$, occasionally modified by the tetrahexahedron $\{hk0\}$. The largest specimen which was found measured 5 mm.; the largest known (in the collections of the British Museum) measures 15 mm. The colour ranges from colourless to nearly black, in pink, blue, and purple shades; another distinct variety is of brown colour. Only the brown variety is fluorescent, due possibly to impurities of luminescent bitumen. The fluorite is associated with dolomite, calcite, quartz, goethite, haematite, limonite, pyrite, chalcopyrite, barite, and several varieties of bitumen.

The fluorite occurs at several horizons and is related to levels of pronounced dolomitisation. It is to be found in geodal infillings, pools, veins and veinlets, and the distribution seems to be associated with the existence of cavities at the time of fluorite deposition. The geodal and veined nature of the dolomitic rocks is probably due to volume shrinkage inherent in the dolomitisation of the limestones. The connection between fluorite concentration and dolomitisation may thus be only indirect, in that the latter process has given rise to favourable conditions for fluorite deposition. In the cavities and early veins of the S beds, the fluorite was deposited immediately after dolomitisation, and the order of deposition of the main minerals is (1) dolomite, (2) fluorite, (3) calcite. In the cavities of the Z beds, fluorite deposition was preceded by the crystallisation of quartz and calcite. In late veins of the S beds, in which dolomite is absent, fluorite followed deposition of calcite and is considered to have been derived from secondary processes.

Consideration of the origin of fluorite is postponed until the occurrences in the Bristol district are surveyed regionally. In a subsequent paper, details will be given of several localities in Gloucestershire and Somerset at which fluorite occurs, most of which have not been previously recorded. For the present, it is necessary to remark that although mineral veins containing galena and barite are to be found in the limestones of the Avon Gorge (for example, in Quarry 4, Somerset side of the Avon), fluorite has not been found in them. Finally, the presence of fluorine in the ground-water of the Carboniferous Limestone of the Avon Gorge is shown by the chemical analyses in Table III. It is interesting to note that in view of the fact that both the St. Vincent's Spring and the Hotwell waters were once used for drinking purposes, the fluorine content in both cases is below the figure generally accepted as the lower limit for the incidence of chronic endemic dental fluorosis (Wilson & Murray, 1943 ; Suckling, 1943).

TABLE III

CHEMICAL ANALYSES OF FLUORINE IN GROUND-WATERS, AVON GORGE

(Analyst : Mr. E. G. Whittle, Public Analyst, City Analyst's Department, Canynge Hall, Bristol)

Source	Content of fluorine in parts per million
St. Vincent's Spring . . (from well)	0·28
Hotwell . . . . (from bank of river)	0·42

ACKNOWLEDGMENTS. The writer is indebted to Dr. Stanley Smith for identifications of fossils and rock-types ; to Mr. William Johnson, City Engineer's Department, Bristol, for assistance in the sampling of waters at St. Vincent's Spring and the Hotwell ; to Mr. E. G. Whittle, Public Analyst for Bristol, for chemical analyses ; to Lt.-Col. W. Campbell Smith, British Museum (Natural History), and Dr. F. S. Wallis, Bristol Museum, for loan of specimens or records ; to Miss V. Boarland for chemical tests and melting point determinations on samples of bitumen ; to Mr. E. W. Seavill for

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EXPLANATION OF PLATES 1 AND 2

Photographs of fluorite and associated minerals from the Carboniferous Limestone of the Avon Gorge, Bristol All the specimens are from the northern part of the Great Quarry, Gloucestershire side of the Avon.

PLATE 1.

Fig. 1. Dolomite-fluorite-calcite geodal infilling (after treatment with dil. HCl). The specks are of haematite, goethite, limonite, chalcopyrite and bitumen. x 2.

—— 2. Zoned fluorite crystals, showing the *a* $\{100\}$ and *f* $\{310\}$, set on rhombohedral dolomite and overgrown by calcite (top right). x 15.

—— 3. Two individuals of zoned fluorite crystallised on rhombohedral dolomite. x 10.

—— 4. Two fluorite cubes in interpenetration. The smaller cube shows a reflection from a tetrahexahedron face ; the bright speck toward the bottom of the large cube is chalcopyrite. x 10.

—— 5. Zoned fluorite crystal with inclusions of haematite-goethite spherulites. x 20.

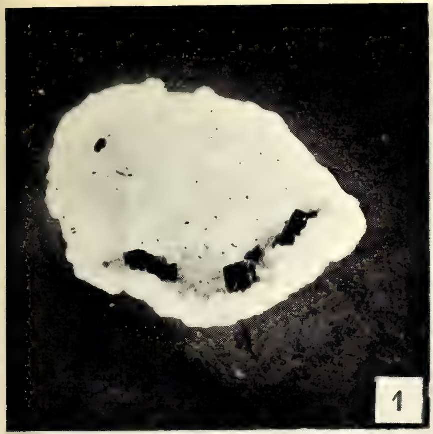
—— 6. Fluorite crystal showing cubic zoning and diagonal-cross effect. x 15.

PLATE 2.

Fig. 1. Dolomite-calcite geode with central infilling of asphaltic pyrobitumen. x 10.

—— 2. Bitumen investing and partially penetrating fluorite crystal. x 10.

—— 3. Dolomite-fluorite-chalcopyrite-bitumen vein. The bitumen is marginal ; the fluorite is dark-coloured ; and the chalcopyrite is shown as a pale-grey cloud near the centre of the vein. x 10.



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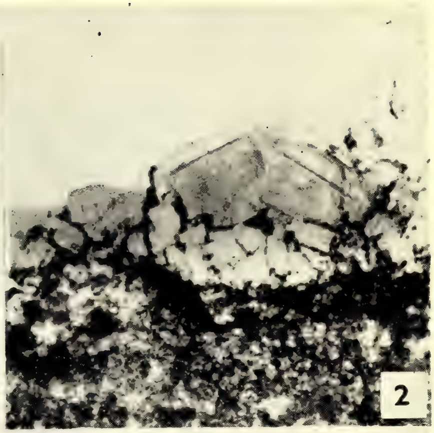

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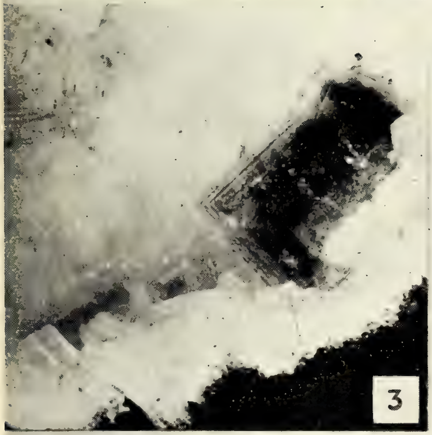

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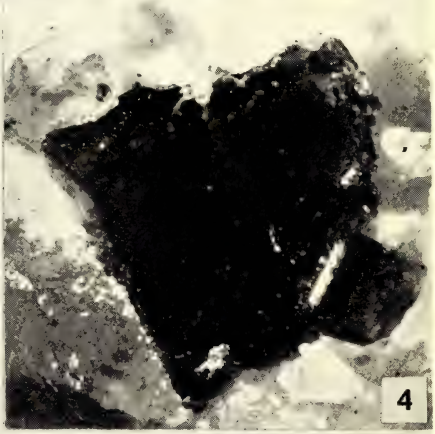

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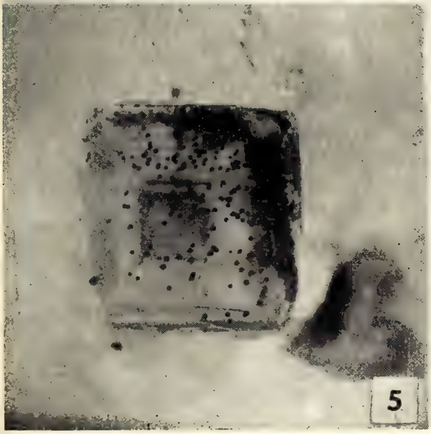

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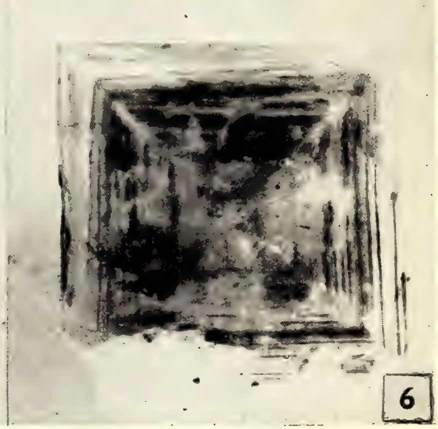
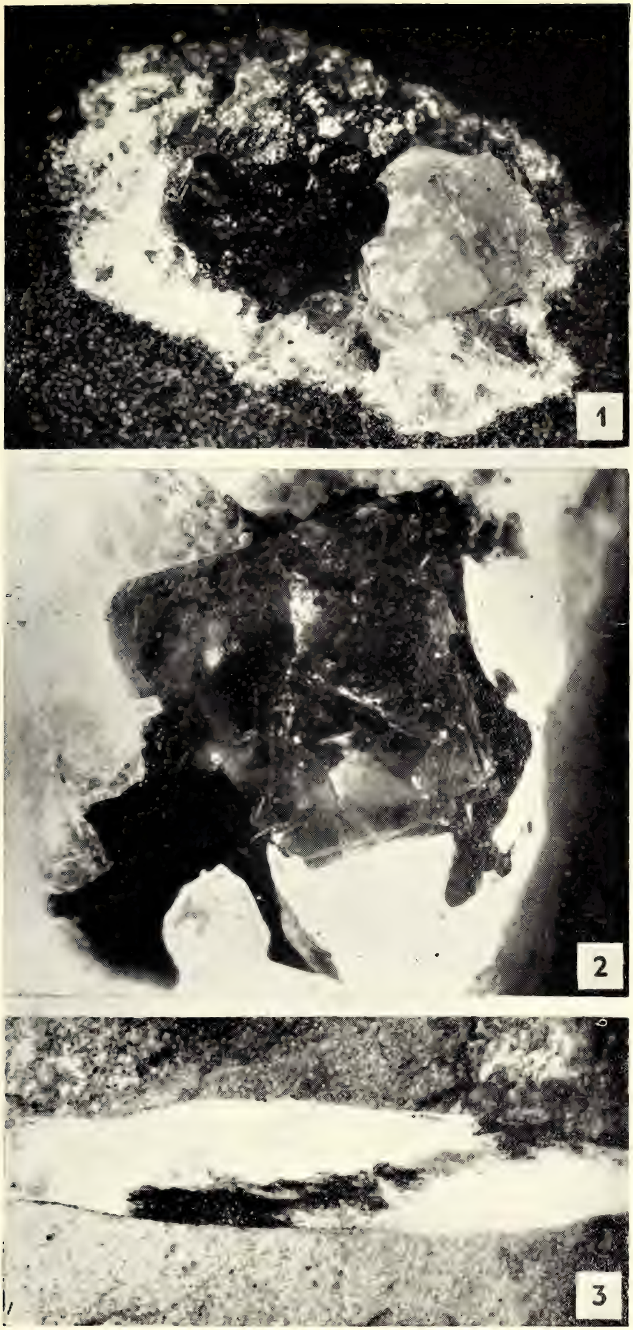


6

Fluorite from the Carboniferous Limestone
of the Avon Gorge, Bristol

Photo : E. W. Seavill]

[*To face p.* 220



Fluorite from the Carboniferous Limestone
of the Avon Gorge, Bristol

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*	Poulding, R. H.	10 West Park Road, Downend, Bristol
	Pratt, Miss D. L.	1 Hughenden Road, Clifton, Bristol, 8
	Pratt, W. W.	Northfield, Pucklechurch, nr. Bristol
	Preston, Miss M.	23 Woodstock Road, Redland, Bristol, 6
H.	Prideaux, R. M., F.R.E.S.	Brastead Chart, nr. Sevenoaks, Kent
	Prowse, D. C., M.B., Ch.B.	Wigmore House, Thornbury, nr. Bristol
	Prowse, Mrs. D. E., M.B., Ch.B.	Do.
A.	Prowse, Miss A. W.	9 Alexandra Road, Clifton, Bristol, 8
A.	Prowse, Miss H. S.	Wigmore House, Thornbury, Bristol
	Pruce, Miss M. M.	St. George Grammar School, Bristol, 5
	Pugh, T.	40 Old Sneed Avenue, Stoke Bishop, Bristol, 9
	Pugsley, Prof. A. G., O.B.E., D.Sc.	Sycamore Cottage, East Harptree, Som.
	Pugsley, Mrs. K. M.	Do.
	Pyke, H. D., M.B., Ch.B.	88 Redland Road, Bristol, 6
	Pyke, Mrs. H. D.	Do.
	Race, Miss E. M.	16 Upper Belgrave Road, Clifton, Bristol, 8
A.	Richards, Miss C. M.	19 Avonmouth Road, Avonmouth, Bristol
	Richmond, D. V., B.Sc.	91 Albert Road, Keynsham, Bristol
	Richmond, Mrs. D. V., B.Sc.,	Do.
	Ricketts, Miss J. B.	Los Angeles, Thingwall Park, Fishponds, Bristol
	Riddiford, Miss A. M., B.Sc.	Pinecroft, Alveston, nr. Bristol
	Rogers, Miss M. H., M.A.	Vyvyan House, Clifton Park, Clifton, Bristol,8
	Ross, F. Stenhouse	25 Tugela Road, Uplands Estate, Bristol, 3
A.	Rowcliffe, J. P. G.	49 Overnhill Road, Downend, Bristol
A.	Rudge, Miss D. M.	6 Elgin Pk., Redland, Bristol, 6
	Russell, R. H.	c/o Summer Cottage, Robin Hood's Bay, Whitby, Yorks.
A.	Salmond, P. W.	22 Tyndall's Park Road, Clifton, Bristol, 8
C.	Salter, Miss J. E. R., B.A.	74 Reading Road, Wokingham, Berks.
	Sampson, Miss A. M.	142 Coronation Road, Bristol, 3
	Sampson, Mrs. A.	Do.
**H.*	Sandwith, Mrs. C. I., F.L.S.	26 Canynge Square, Clifton, Bristol, 8
	Savery, Miss N. J.	129 Redland Road, Bristol, 6
	Savory, J. H.	61 Lower Redland Road, Bristol, 6
	Savory, Mrs. J. H.	Do.
L.	Scase, R. P.	Lower Northend Farm, Batheaston, Som.
	Scott, P., M.B.E., D.S.C., M.A.	New Grounds, Slimbridge, Glos.
A.	Scott, Miss S. D.	4 Chapel Green Lane, Redland, Bristol, 6

DEC 8 1952

C.	Sharp, Mrs. J. E.	Mary Paddock Farm, Nempnett, nr. Chew Stoke, Som.
	Shaw, A., A.S.A.A.	34 Whitecross Avenue, Wells Road, Bristol, 4
	Shaw, Mrs. A.	Do.
	Shaw, Miss D.	48 Kellaway Avenue, Westbury Park, Bristol, 6
*	Shaw, Miss T.	12c Kingsdown Parade, Bristol, 6
	Sherrell, F. W.	51 Horfield Road, Bristol, 2
	Shinner, H. S.	The Chase, Kingswood, Bristol
	Simpson, Scott, B.A., Dr. rer. nat., F.G.S.	Geology Dept., Bristol University
*	Skene, Prof. M., D.Sc., F.L.S.	Dept. of Botany, Bristol University
	Skene, Mrs. M.	36 Lawrence Grove, Westbury-on-Trym, Bristol
	Skinner, R. A.	39 Apsley Road, Clifton, Bristol, 8
	Sloane, J. F., B.Sc.	Burwalls, Bristol, 8
	Smith, D. Munro, M.R.C.S., L.R.C.P.	Lodge Cottage, Lodge Road, Kingswood, Bristol
	Smith, E. L.	18 Carnarvon Road, Bristol, 6
	Smith, J., M.I.M.E.	Chelwood House, Pensford, nr. Bristol
	Smith, Miss M. A. V.	80 Hampstead Road, Bristol, 4
*	Smith, Stanley, M.A., D.Sc., F.G.S.	69 Claremont Road, Bristol, 7
C.	Standring, A. J., B.Sc.	12 Oakfield Road, Bridgwater, Som.
	Stanhope, Rev. A. J.	182 Bishop Road, Bishopston, Bristol, 7
C.	Stevens, Miss U.	"Swancroft," Compton Martin, nr. Bristol
	Stone, G. S.	9 Bloy Street, Easton, Bristol, 5
*C.	Stride, A. H. B., B.Sc., F.G.S.	21 Rutland Park Mansions, Walm Lane, Willesden Green, N.W.2
C.	Stubbs, R. L.	"Hill View," Haw Lane, Olveston, nr. Bristol
A.	Sutcliffe, A. J.	Camber, Sandringham Gardens, Paignton, Devon
	Sutton, M.	14 Woodcroft Avenue, Whitehall, Bristol, 5
C.	Swaine, Miss A. K., F.R.A.S.	Pisang Cottage, Nailsea, Som.

	Tasker, L.	4 Whiteladies Road, Bristol, 8
	Taylor, Miss A. E.	16 Cotham Road, Bristol, 6
	Taylor, G. H.	107 Sylvan Way, Sea Mills, Bristol
	Taylor, S. M., B.Sc., S.I.Mech.E.	23 St. Alban's Road, Bristol
	Taylor, W. R., M.A.	5 Pembroke Vale, Clifton, Bristol, 8
A.	Teear, Miss N.	9 Trymside, Sea Mills, Bristol, 9
	Tetley, Mrs. H.	4 The Avenue, Sneyd Pk., Bristol, 9
*C.	Trueman, Sir Arthur E., F.R.S., D.Sc., F.G.S.	38 Belgrave Square, London, S.W.1
A.	Tucker, M.	24 West Park Road, Downend, Bristol
	Tucker, Miss R.	Barrow Court, Barrow Gurney, nr. Bristol
A.	Turner, Miss D. M.	325 Two Mile Hill Road, Kingswood, Bristol
	Turner, Mrs. E.	Do.
	Turner, H. W., M.A., F.G.S.	The University, Bristol, 8
	Turner, Mrs. H. W.	The Cottage, Kensington Place, Clifton, Bristol, 8

A.	Vincent, H.	5 Cotham Road, Bristol, 6
A.	Vincent, Mrs. H.	Do.
	Vinnicombe, Miss E. J., M.A.	Denver, Ridgeway, Long Ashton, Bristol

	Wakefield, Mrs. G. S.	"Vanda," 2 Southwood Avenue, Coombe Dingle, Bristol, 9
	Walker, Miss A.	Manor Hall, Clifton Hill, Bristol, 8
	Walker, Miss E.	24 Stanley Street, Stapleton, Bristol, 5

_C._	Wallington, W. A.	"Penwarden," Station Road, West Town, nr. Bristol
_C._	Wallington, Mrs. H. E.	Do.
_C._	Wallington, Miss J.	Do.
*	Wallis, F. S., Ph.D., D.Sc., F.G.S.	City Museum, Bristol, 8
	Wallis, Rev. G. C. W., M.C., B.A.	c/o The Rectory, Stapleton, Bristol
	Wareham, Miss C. A. L.	6 Belvedere Road, Durdham Down, Bristol, 6
	Wareham, Miss F.	Do.
_C._	Wareing, Miss M., B.Sc.	Ivy Cottage, Compton Martin, Bristol
*_C._	Warne, L. G. G., M.Sc., Ph.D.	Dept. of Botany, The University, Manchester, 13
	Watkins, N. A., M.A. F.R.E.S.	9 Druid Road, Stoke Bishop, Bristol, 9
	Watters, Miss E. D., M.A.	The Little House, Frenchay, Bristol
	Watters, Miss M. M., M.A.	Do.
_A._	Way, D. W.	c/o Mrs. Rattle, Cambridge Batch, Flax Bourton, nr. Bristol
_C._	Webb, H. F.	Elmside, Old Town, Wotton-under-Edge, Glos.
	Webb, H. M., B.Sc.	Camp House, Clifton Down, Bristol, 8
	Weedon, Miss M. F.	12 Luccombe Hill, Redland Green, Bristol, 6
	Weir, Mrs. A. M.	Hursley Hill, Whitchurch, nr. Bristol
_A._	Weir, D. A.	Do.
*_C._	Welch, F. B. A., B.Sc., Ph.D. F.G.S.	H.M. Geological Survey, Exhibition Road, S.W.7
	Westcott, Miss M. V.	20 Linden Road, Redland, Bristol, 6
	Weston, F. J.	The Tynings, Chew Stoke, nr. Bristol
	Whistler, L. D.	8 Dundonald Road, Redland, Bristol, 6
_A._	White, D. G.	85 Runswick Road, Brislington, Bristol, 4
	White, J. D.	46 St. Paul's Road, Clifton, Bristol, 8
	Whitehouse, F. W.	8 Old Street, Clevedon, Som.
*	Whittard, Prof. W. F., Ph.D., D.Sc., F.G.S.	Dept. of Geology, Bristol University
_C._	Wight, Miss N. W., B.Sc.	23 Clevedon Road, Weston-super-Mare, Som.
	Williams, E. C.	3 Queen Square, Bristol, 1
	Williams, Mrs. G. E.	Strathmore, Passage Road, Westbury-on-Trym, Bristol
	Wills, R. F.	40 Claremont Road, Bishopston, Bristol, 7
	Wills, Mrs. R. F.	Do.
	Wiltshire, Miss M. O. P., D.Sc.	Clifton Hill House, Bristol, 8
	Winchester, Miss D. E.	4 Langton Road, St. Anne's Park, Bristol,
	Winnall, T. J.	22 Grosvenor Place, Bath, Som.
*_H._	Womersley, H., F.R.E.S., A.L.S.	Museum, North Terrace, Adelaide, S. Australia
	Woodland, P., M.A.	Redwick, Dursley, Glos.
	Wostenholm, Miss M.	2 Lower Hanham Road, Hanham, Bristol
	Wright, M. A.	Woodside, Glebe Road, Long Ashton, Bristol
*_C._	Yonge, Prof. C. M., F.R.S., D.Sc.	The University, Glasgow

AFFILIATED SOCIETIES

Natural History Society, Diocesan Training College, Fishponds, Bristol
Natural History Society, Grammar School, Dursley, Glos.
Botanical and Zoological Societies, The University, Bristol, 8
Geological Society, Do. Do.
Natural History Society, City of Bath Training College, Newton Park, Newton St. Loe, Bath
Scientific Society, Red Maids' School, Westbury-on-Trym, Bristol
Bristol Grammar School Field Club, Elton Road, Bristol, 8
Kingswood Grammar School, nr. Bristol

REPORT OF COUNCIL

1951

THE total membership of the Society decreased during the year from 430 to 408, and whereas in January there were 262 full members, at the end of the year the number was 247. The Society's stall at the Bristol ('Our Way of Life') Exhibition helped to publicise the activities of the Society and more new members than usual joined during the second half of the year.

At the Annual General Meeting Mr. H. H. Davis was re-elected President and Dr. L. Harrison Matthews and Mr. T. H. Payne were elected Vice-Presidents. Other Officers and Council were elected as shown on page 222 of this issue.

The Society had an active year. As well as the usual General and Sectional meetings, marked by some outstanding lectures and film displays, a stall was set up at the Bristol Festival of Britain Exhibition, and the Society's own very successful exhibition was held in two of the botany laboratories of the University on two consecutive evenings in September. This exhibition was also open to school parties by invitation on one afternoon and was visited by about 200 very appreciative children.

The thanks and congratulations of Council were extended to the Hon. Librarian, Dr. L. Harrison Matthews, who left Bristol early in the year to take up his appointment as Director of the Zoological Society of London.

The Society's Rules have been scrutinised and revised, and membership application forms re-drafted by special committees of Council, and thanks were extended also to members of these committees and to those responsible for organising the exhibitions.

The deaths of Mr. G. Richards, Mr. F. A. Stinchcombe and Mr. J. P. Studer were recorded with regret during the year, as were those of Mr. J. W. Tutcher and Mr. L. F. H. Audcent of whom obituary notices appeared in the last number of the *Proceedings*.

E. J. VINNICOMBE, *Hon. Secretary*

HON. LIBRARIAN'S REPORT

1951

PERIODICALS have been received from 97 societies and organisations during the year, and 4 books have been bought. Two subscription volumes (*British Mysidacea*, and *British Spiders*, Vol. I) have been received from the Ray Society.

The Society has started exchanging publications with the Finnish Zoological-Botanical Society, Vanamo. This Society has very kindly sent us the following volumes in exchange for our *Proceedings* :—

Annales Societatis Zoologicae-Botanicae Fennicae, Vanamo, 1926–31
Annales Zoologici Societatis Zoologicae-Botanicae Fennicae, Vanamo, 1935–51
Annales botanici Societatis Zoologicae-Botanicae Fennicae, Vanamo, 1931–50
Archivum Societatis Zoologicae-Botanicae Fennicae, Vanamo, 1946–51

Two hundred and thirty-eight volumes were borrowed by 44 members during the year.

N. W. MOORE, *Hon. Librarian*

The Hon. Treasurer in Account with the Bristol Naturalists' Society

RECEIPTS AND PAYMENTS FOR THE YEAR ENDING 31 DECEMBER, 1951

Dr.

1950 £ s. d.		£ s. d.	£ s. d.	£ s. d.
	To Members' Subscriptions :—			
	Full 1950	4 0 0		
	1951	233 2 6		
	1952	7 0 0		
263 11 6			244 2 6	
	,, (beyond 1st of household) 1950	10 0		
	1951	21 10 0		
	1952	10 0		
26 10 0			22 10 0	
	Country Members 1950	1 0 0		
	1951	22 1 0		
	1952	10 0		
24 11 0			23 11 0	
	" Old " Associates 1950	1 1 6		
	1951	6 11 0		
	1952	7 0		
7 5 0			7 19 6	
	" New " ,, 1950	10 0		
	1951	5 12 6		
8 12 6			6 2 6	
6 0 0	Affiliated Societies 1951		7 0 0	
				311 5 6
336 10 0				
6 9 8	,, Separates and Covers of *Proceedings* (Blocks, etc., paid subsequently £6 5s. 1d.)			3 5 9
3 15 3	,, Sale of Bird List			– – –
3 19 9	,, Sale of other Publications			7 4 6
3 19 6	,, Profit on Dinner			3 11 2
6 11 11	,, Interest on Deposit in Post Office Savings Bank			7 2 5
361 6 1				332 9 4
328 16 1	,, Balances from last Account			269 13 3
690 2 2				£602 2 7

A. H. PEACH, *Hon. Treasurer*,
2 January, 1952

Cr.

1950 £ s. d.		£ s. d.	£ s. d.
	By Subscriptions :—		
1 1 0	Ray Society	1 1 0	
3 5 0	Zoological Society (London)	3 5 0	
2 2 0	S.W. Naturalists' Union	2 0 0	6 6 0
247 18 9	,, *Proceedings* (1950)		139 0 4
32 3 6	,, Stationery and Printing		32 11 3
	,, Postages, etc. :—		
	Hon. Secretaries	26 11 2	
	Hon. Treasurer	3 14 5	
	Hon. Editor	15 0	
	Hon. Librarian	2 7 0	
27 14 7			33 7 7
1 10 0	,, Fire Insurance (Library)		1 10 0
15 5 1	,, Books and Periodicals		7 5 6
1 0	,, Rent (use of Library Room)		1 0
8 0	,, Bank Charges		6 6
8 12 0	,, Fares and Expenses of Meetings		14 14 5
5 10 0	,, Clerical Assistance (issue of Circulars, etc.)		6 0 0
2 10 0	,, Field Committee : Expenses		4 14 2
22 17 6	,, Book-binding		20 15 0
6 6	,, Repairs to President's Badge		– – –
– – –	,, Expenses of Festival Exhibition		6 2 7
	,, Grants to Sections :—		
10 0 0	Botanical	– – –	
3 4 0	Entomological	3 0 6	
21 0 0	Geological	15 0 0	
15 0 0	Ornithological	15 0 0	
			33 0 6
420 8 11			305 14 10
	,, Balances to next Account :—		
126 5 2	Cash at Bank	102 4 4	
133 1 4	Deposit in Post Office Savings Bank	185 3 2	
10 6 9	Cash in hands of Hon. Secretaries	9 0 3	
			296 7 9
690 2 2			£602 2 7

Audited and found correct,
Bristol, January 27, 1951 F. W. EVENS, *Hon. Auditior*

REPORT OF BOTANICAL SECTION

1951

MEETINGS were held each month throughout the year and have on the whole been well attended. During the summer months, indoor meetings were as usual given up to the study and naming of exhibits, and for the winter months the following lectures were arranged :—

Jan. 15. Mr. J. H. Lavender : " Geographical Distribution of some Local Plants."
Feb. 19. Miss E. H. Stevenson : " Some Common British Mosses."
Mar. 19. Mr. F. Rose : " Some Comparisons between the Bristol Flora and that of S.E. England."
Oct. 15. Professor M. Skene : " Mosses and Liverworts."
Nov. 19. Dr. J. H. Davie : " Poisonous Plants."
Dec. 17. Dr. A. F. Devonshire : " Plant Life around Cambridge."

In addition to the botanical field-meetings reported elsewhere in this issue, members met for a number of field-walks. The first, arranged by Mrs. Wakefield, took place in April, when members were shown round the Alpines, Shrubs and Glasshouse Plants at the Zoological Gardens, Clifton, by the head gardener, Mr. J. Hughes. In May Dr. Devonshire led a field-walk from Clevedon to Cadbury Camp. The early June meeting was a visit by coach to the Harptree district of Mendip, arranged and led by Mr. T. H. Payne. Later in the same month Dr. D. C. Prowse led a walk from Thornbury to Tytherington. Mr. I. Evans was the leader for the July and September walks—the former from Whitchurch to Keynsham, and the latter from the same starting point to Wollard, Compton Dando and Keynsham. The August field-meeting was cancelled on account of bad weather, but this walk, to Norton Malreward, led by Miss D. Shaw, took place in September.

Several members sent exhibits to the Bristol Festival, "Our Way of Life", Exhibition held in July, and the Section was well represented at the B.N.S. Exhibition held in the Botany Department of the University in September. Exhibits included :—

Specimens from rhines and ponds, and microscope slides of diatoms and seeds of pond plants : Mr. F. W. Evens.
Pondweeds, Liverworts, Duckweeds and Algae : Mrs. C. I. Sandwith.
Pond life in Henleaze Lake : Mrs. A. Davies and Miss Burdock.
Herbarium and fresh specimens from the banks of the River Avon between the Suspension Bridge and Avonmouth : Dr. C. L. Corbett and Mrs. G. S. Wakefield.
Faciation in plants : Mrs. E. M. Bell.
Herbarium specimens : Mr. I. Evans.
A collection of fresh specimens : Miss D. Shaw.
Asplenium marinum L. and leaves of *Eucalyptus* spp. : Miss V. Cook.
Microscope slides of general interest : Mr. E. Gibbens.
Photograph of *Epipactus purpurea* Sm. from a S. Glos. wood : Mrs. M. L. Davis.
A large specimen of *Datura stramonium* L. from Chew Stoke, complete with numerous fruits : Mr. T. H. Payne.
A species of tropical cucumber grown from a seed found in a dried *Luffa cylindrica* : Mrs. Milton.

The British Ecological Society has granted Affiliation Membership to the Section.

M. L DAVIS, *Hon. Secretary*

REPORT OF ENTOMOLOGICAL SECTION

1951

AT the 87th Annual General Meeting of the Section, held on 8 Jan., Mr. J. V. Pearman did not accept re-election as President as he was leaving the Bristol area. Mr. A. H. Peach was elected President and Mr. C. S. H. Blathwayt was re-elected Hon. Secretary.

On Feb. 5 Dr. H. E. Hinton gave a most interesting talk on " Sound-production in the Lepidoptera ".

On March 5 Mr. J. V. Pearman spoke on " Insect Curiosities ". At the end of his talk the Section learned witn regret that this would be the last talk Mr. Pearman would be able to give owing to his departure from Bristol.

On Saturday, May 19, the Section held a Field Meeting at Tintern, Monmouthshire. The weather was only moderate and there was little sun, and, because of the lateness of the season, few insects were seen, though some moths were observed on tree-trunks on the high ground.

On Saturday, June 30, the Section held an afternoon Field Meeting, in conjunction with the Entomological Section of the Somerset Archaeological and Natural History Society, at Berrow Sand Hills, near Burnham-on-Sea. The weather for this meeting was perfect and a number of butterflies were seen, together with some moths and examples of other Orders.

On Oct. 9 the Annual Exhibition of the Section was held and several interesting exhibits were shown and explained by members.

On Nov. 5 another interesting talk was given to the Section by Dr. H. E. Hinton. The subject was " Hormones and Lepidoptera ".

On Dec. 3 Mr. Norman Watkins spoke to the Section on " The Life Story, Migration and Occurrences in Europe of *Danaus plexippus* (Monarch or Milkweed Butterfly) ". The Section much enjoyed Mr. Watkins' talk.

C. S. H. BLATHWAYT, *Hon. Secretary*

REPORT OF GEOLOGICAL SECTION

1951

TWELVE General Meetings were held during the year ; of these six were indoor meetings with an average attendance of 57, and six were outdoor meetings with an average attendance of 25.

At the Annual General Meeting, which was held on January 23, the following Officers were elected : Dr. F. Coles Phillips, President ; Dr. Stanley Smith, Vice-President ; Mr. I. S. Loupekine, Hon. Secretary ; and Mr. D. T. Donovan, Recorder. Sir Lewis Fermor, Dr. A. Marsden, Mrs. M. Marsden, Mrs. M. M. Perkins, Mr. H. S. Shinner, Mr. H. W. Turner, Dr. F. S. Wallis and Professor W. F. Whittard were appointed Committee Members. The formal business was preceded by an Exhibition of Members' Collections, in which the usual high standard was maintained. The more notable exhibits were as follows :—

Messrs. B. C. Betts and A. J. Sutcliffe : Geological specimens from Vesuvius and Sicily, 1950.
Mr. M. L. K. Curtis : Tremadoc fossils from the Tortworth Inlier.
Mr. D. T. Donovan : Lower Lias Ammonites from the Saltford cutting.
Messrs. I. H. Ford and I. S. Loupekine : Radioactive minerals.
Mr. T. R. Fry : Fossil specimens excavated at Bitton.
Messrs. R. and D. C. Goldring : Preliminary record of a bore-hole in the Orleigh Court deposits, Bideford.
Mr. M. Y. Hassan : Dwarfed fossils from the Esna Shales, Egypt.
Dr. F. Coles Phillips : Colour transparencies of oriented minerals in metamorphic rocks.
Mr. F. Stenhouse Ross : Collection from the Inferior Oolite on Mr. Channon's excursion, 24 June, 1950.
Mr. F. W. Sherrell : Geological specimens collected during the Lauge Koch Expedition to East Greenland, 1950.
Dr. Scott Simpson : *Drepanopterus abonensis* n. sp. (the Eurypterid first discovered on the Section's field meeting at Portishead on 9 August, 1948).
Mr. F. A. Stinchcombe : Selected fossils from the Grove Farm—Mandalay locality, Dundry.
Mr. H. W. Turner : Some alpine rocks.
Mrs. G. S. Wakefield : Selection of agates.

On February 15 Professor J. G. C. Anderson (University College, Cardiff) gave an illustrated lecture on "Geology and Hydro-electric Power", in which he described the part that the geologist played in the recent development of hydro-electric schemes in Scotland, such as, for example, the Loch Sloy project.

On March 13 Mr. M. L. K. Curtis, in speaking on "The Geology of the Tortworth Inlier", gave the results of his researches on the Palaeozoic rocks of the area, in which he had established an unconformable relationship between the Tremadoc and Upper Llandovery. An exhibited specimen which was obtained from a trench 12 feet deep showed the actual junction.

Of the six Field Meetings held during the Summer, one was a whole-day, three were afternoon, and two were evening excursions : a motor-coach was used on two occasions. On April 28 the Bath stone workings at Corsham were visited by courtesy of the Bath & Portland Stone Firms Co. On June 13 Professor Whittard led an evening excursion to Kingsweston where steeply inclined Old Red Sandstone rocks overlain by Triassic breccias were examined. On June 23 a day was spent in the Vobster-Mells-Frome area where, under the leadership of Dr. Scott Simpson, the Mesozoic/Palaeozoic unconformity was followed in detail. On June 21 the Section visited Bitton, where collecting was carried out from the trenches which had been dug in the Midford Sands by the leader, Mr. T. R. Fry. On August 16 Mr. E. W. Seavill guided a party in Bristol to examine the local building-stones. Finally, on September 15 a joint meeting with the University of Bristol Tutorial Class in Geology took place, when Dr. Wallis and Mr. Loupekine led a coach party to examine the old mineries and mineral-collecting localities on the Mendip Hills.

On October 16 Professor A. G. Pugsley delivered a lecture entitled " Soils from an Engineer's Standpoint ", in which he showed the importance of soil-mechanics which underlies many problems in engineering.

On November 15 Dr. J. D. H. Wiseman (British Museum of Natural History) gave a discourse on " Secrets of the Ocean Bed ", in which he surveyed recent advances in sea-floor investigations and gave preliminary results of study carried out at the British Museum on a deep-sea core taken in the Atlantic Ocean.

On December 11 Dr. Stanley Smith addressed the Section on the subject " Bristol Geology in 1851 ". An illustrative exhibition of contemporary books, maps and geological specimens was held in conjunction with the address, and the following were notable among an entry of about 70 items : James Hutton's *Theory of the Earth*, 1795 ; Playfair's *Illustrations of the Huttonian Theory*, 1802 ; William Smith's *Strata identified by Organized Fossils*, 1816, *Stratigraphical System*, 1817, and Geological Maps of Wiltshire and Gloucestershire, 1819. Mr. T. R. Fry exhibited collections of Cotham Marble and Bristol Diamonds ; and Mr. M. L. K. Curtis exhibited a selection of fossils from the Joseph Chaning-Pearce collection (*ca.* 1830–1850) lent by the Bristol City Museum.

It is with great regret that the Section records the deaths of Mr. G. Richards, Mr. J. P. Studer, Mr. F. A. Stinchcombe and Mr. J. W. Tutcher.

I. S. LOUPEKINE, *Hon. Secretary*

REPORT OF ORNITHOLOGICAL SECTION

1951

THE WREN THE WREN
THE KING OF ALL BIRDS

AT the 28th Annual General Meeting, on Jan. 24, Mr. A. C. Leach was elected President in succession to Mr. W. R. Taylor, who had served his full term of three years in office. Mr. H. H. Davis was re-elected Hon. Secretary. The following General Committee was elected to replace the existing Field-work Committee—Mr. A. E. Billett, Mr. G. E. Clothier, Mr. B. King, Mr. N. W. Moore, Mr. R. H. Poulding, Miss M. H. Rogers and Mr. J. H. Savory, with officers of the Section and the retiring President as *ex-officio* members. The new Committee met on Feb. 6, when Mr. A. C. Leach was appointed Chairman, Mr. A. E. Billett Vice-Chairman, and Mr. G. E. Clothier Hon. Secretary; two additional members were co-opted—Mr. H. Dunnicliff and Miss C. A. L. Wareham.

Subsequent meetings of the Section, devoted chiefly to lantern lectures or films, were:

Feb. 16. Mr. G. K. Yeates: "Two Summers in Iceland."
Mar. 9. Rev. Professor C. E. Raven: "Early Ornithologists."
Oct. 5. Mr. W. R. Taylor: "Some Reflections on the Scientific Naming of Birds."
Oct. 24. Exhibits and Communications by Members.
Nov. 16. Dr. N. Tinbergen: "Fighting, Threat and Territory in Birds."
Dec. 7. Mr. C. W. Holt: Colour-films—"The Fair Isle, Isle of May and Gibraltar Point Observatories."

A field-programme meeting was held on Mar. 30, when copies of the 1950 Field-work Report were made available, and notice was given that the following species had been scheduled for special study during 1951: Corn-Bunting, Tree-Sparrow, Wood-Lark, Red-backed Shrike, Pied Flycatcher, Wheatear, Stonechat, Dipper, Nightjar and Kingfisher. Other field-work arrangements for the current year included the completion of nest-cards, duck counts at the reservoirs and an enquiry into the distribution and movements of gulls in the Bristol area during the period Apr. 1 to the end of September.

Early morning watches along the Severn Estuary for Starlings, Chaffinches, Sky-Larks and other diurnal migrants took place on Oct. 14 and 28. Eleven members participated, and among localities visited were Littleton, Hallen Marsh, Wick St. Lawrence and Brean Down. Observations have been forwarded to the British Empire Naturalists' Association and will be incorporated in its 1951 *Report on the Autumnal Movements of Certain Small Passerines.*

Two evening field-meetings were organised—a riverside walk from Pill to the mouth of the Avon on May 4 and a hedgerow and woodland walk at Little Stoke Farm on the 23rd. Both were well attended.

On May 27 thirty-five members took part in an all-day excursion to the chalk downs and the heathlands of East Dorset. This, despite weather which could hardly have been worse, was a great success. Good views were obtained of a Roebuck and of such scarce and interesting birds as Dartford Warbler, Montagu's Harrier and Stone-Curlew. Special thanks are due to Dr. K. B. Rooke of Cranborne for his active co-operation and expert guidance of the party.

The Membership Roll totalled 145 at the close of the year.

H. H. DAVIS, *Hon. Secretary*

ACCOUNT OF THE GENERAL MEETINGS, ETC.

1951

THE 88th Annual General Meeting was held on January 18, the Annual Dinner on February 1, and an Exhibition Meeting on September 26 and 27. The Society also exhibited at the Bristol Festival Exhibition in July. The meetings on March 1, April 5, Nov. 1 and Dec. 6 were addressed by Mr. F. Hoyle, Dr. N. L. Bor, Professor F. Blakemore and Mr. C. G. Butler respectively. Attendances ranged from 44 to 178, with an average of 88. There were also General Field Meetings.

At the Annual General Meeting Mr. H. H. Davis was unanimously re-elected President, and delivered his Presidential Address on " The 10th International Ornithological Congress, Uppsala, Sweden, June, 1950 ". After a vivid description of this ancient cultural centre, the President went on to outline the work of Linnaeus, so closely associated with it. He then gave an account of the varied activities of the Congress itself and the chief problems which were being studied by its members.

After the Annual Dinner, held in the Senior Common Room of the University, Dr. G. M. Hickman gave an account of her recent tour of the United States of America and showed a series of very fine colour-transparencies.

At the March meeting Mr. F. Hoyle gave a lecture on "Astronomy", illustrated by lantern-slides and followed by a vigorous discussion. The speaker began by showing pictures of nebulae and considering how the few bright stars greater than our sun might have arisen by condensation during their passage through a gas-cloud. The speed of our sun was too great for it to be collecting gas now, but, at hundred year intervals in the past, it might have travelled slowly enough to sweep up interstellar gas fairly rapidly. Mr. Hoyle discussed the possible effects of this recurrent process on the earth's climatic history. He compared the causal efficacy of this hypothesis with that of other theories put forward to account for climatic change.

At the April meeting, Dr. N. L. Bor spoke about " The Royal Botanic Gardens, Kew : A Research Institution ". He described the history, administration and work of the gardens and illustrated his talk by excellent lantern-slides.

During the Festival of Britain celebrations in Bristol, a Civic Exhibition was staged on the Horfield Memorial Ground from July 7–21. It was entitled " Our Way of Life " and consisted of an exhibition of the work of the Corporation of Bristol, occupying two marquees, and many stands in two more marquees, where the societies and voluntary organisations of Bristol showed to the public some of their activities. Our Council appointed a Committee to arrange the Society's Exhibit, which was centered around a large, coloured picture-map of the Bristol area. On the map, places of interest to the various Sections of the Society were named. Each Section had a table and displayed material and photographs corresponding to these places and marked with similarly coloured labels. Mr. Bell, of the Entomological Section, displayed, in addition, a vivarium containing very active specimens of Privet Hawk Moth caterpillars and Eyed Hawk Moth caterpillars. The work of feeding these for a fortnight was considerable, but well worth while. About 40 members took turns in having charge of the stand, two at a time. They answered questions about the Society, showed some of the Society's literature and bulletins, and gave application forms to interested people. The whole stand aroused great interest and many members of the public expressed their pleasure in it.

The September exhibition was equally successful. It was divided into two sections and filled two laboratories. One part was entitled " Rivers, Ponds. Lakes and their Life ", and every Section of the Society contributed to this.

The Botanical Section had a display of water plants, a survey of the Avon, and many herbarium specimens. The Ornithological Section had some excellent photographs. The Entomological Section showed live dragonflies and various forms of water life, some under the microscope. The Geological Section showed specimens illustrating the sediments, minerals and rocks, produced in such bodies of water, some flint implements, and diagrams illustrating the formation of the West Country river system. In the second section the exhibits were of a general nature and included many cases of butterflies and moths, live insects, herbarium specimens, ornithological photographs from Lundy and X-ray photographs of Mendip minerals. The exhibition was open on two evenings for members, and on one afternoon for schools. On the first evening, when the exhibition was opened by Dr. Wallis, about 100 members attended, and on the second evening about 50 members ; 21 secondary schools were invited to send small parties, and, of these, 15 sent about 15 pupils and a member of staff each. The exhibition was much appreciated by all who visited it, and thanks are due to the members who exhibited specimens. Next year it is hoped to invite more visitors to see the exhibition.

In his lucid and entertaining talk on " Our Cattle " on Nov. 1, Professor Blakemore described the domestication of animals as one of man's outstanding achievements. He mentioned the obvious and the more obscure products derived from cattle, and outlined the main developments in cattle-feeding and cattle-breeding throughout recent years.

Members of the Somerset Bee-keepers' Association were present by invitation at the December meeting, when Dr. C. G. Butler, of Rothamsted Experimental Station, described " Some Aspects of Bee Behaviour ". He instanced two kinds of sensitivity peculiar to bees : their perception of water and their sense of the passage of time. The response of bees in maze experiments had confirmed that touch was also an important sense. Bees' perception of colour was determined by their range of spectrum sensitivity. They saw ultra-violet as a true colour but were insensitive to red. Although they could be trained to associate simple patterns with food, bees confused certain shapes. Broken outlines and slowly moving objects were more easily perceived than whole shapes and still objects. Foraging bees were dependent on colour for distant perception and on scent which induced settling, for closer perception. Mr. Butler's talk was illustrated by lantern-slides, and his specialist audience questioned him appreciatively and with keen interest at the end of his fascinating lecture.

FIELD MEETINGS

The first meeting of the season was on April 21, when a party of 59 members visited Stoneaston, Emborough, Mendip and Stratford Mill. The Leaders were Messrs. T. H. Payne and F. J. Weston. At Stoneaston Park the party was welcomed by Comdr. and Mrs. Hippesley, who conducted us round the grounds and through part of their stately home. The wonderfully fitted workshop was a source of great interest. Emborough pond was next visited ; then Priddy, for tea at the Miners' Arms. After tea we visited the Devil's Punchbowl, a large, deep, circular swallet, near Vaunt Pitts farm, and then went to Harptree Hill quarries. Our last call was at Stratford Mill, West Harptree, to see the old grist-mill, which was set in motion by Mr. Wilson, the tenant, so that it could be seen working as it had been doing for over two hundred years. It has now been given to the Bristol Corporation, by the Waterworks Co., to be erected in Blaise Castle Estate.

On Saturday, May 26, the meeting of the month was at Wotton-under-Edge and attended by 56 members. An interesting walk was arranged by Messrs. H. F. Webb and I. W. Evans. They led us to the Wortley district ; proceeding via Tor Hill to Black Quarries Hill, we had a view of the beautiful Tiley Valley. The return journey was made through Coombe Valley, and after tea some of the party decided to visit Wookridge Wood where the interesting flora was examined.

The June meeting was held on Saturday, the 16th, when a visit was made by coach to Wells. The Leaders were Messrs. F. W. Evens and E. H. Day. From Wells the party walked up Milton Lane to Milton Hill and from the top enjoyed the fine view of the Somerset plains with distant views of Glastonbury Tor, the Polden and Quantock Hills and Brent Knoll in the West. Some worked-out quarries were visited *en route* and geologists and botanists found subjects of interest. The party returned by a field-path to Wookey Hole where tea was provided. After tea the party ascended Ebbor Gorge by the steep footpath up the centre. As the path narrowed and became steeper, so the vegetation changed, passing at the top into a small wood and then becoming open moorland. The stream at the bottom of the gorge provided water-plants, mosses and ferns. Forty-six members were present.

On Saturday, July 14, a joint meeting with the Bath Natural History Society was held in the Glastonbury area. There were three Leaders : two from Bristol —Dr. A. V. Devonshire and Mr. I. W. Evans, and Comdr. R. D. Graham, R.N., from Staywell House, nr. Bridgwater. The weather was again perfect and the rubber-boots members were advised to bring were unnecessary. At Sharpham Crossing, Comdr. Graham met us and preceded us in his car to Turbary East Drove. Here we walked for about half-a-mile to the ' charity plot ', so called on account of the villagers' being allowed to cut the peat free of charge. This 'plot' had acid, bog vegetation and such plants as *Drosera rotundifolia*, *D. longifolia*, *Utricularia minor*, *Sparganium minimum*, *Habenaria bifolia* and many others were seen. Returning along the same Drove to the coaches we were taken back to Glastonbury, for tea at the Abbey Gate Café. After tea the parties were conveyed to Catcott Heath, and walked to the ' Ten Acre ' enclosure by way of Higher Ropes Drove. Here the fen vegetation was in marked contrast to the acid bog of Street Heath, and some of the plants noticed were *Lathyrus palustris*, *Stellaria glauca*, *Sium latifolium*, *Cladium*, *Peucedanum palustre*, etc. Comdr. Graham made an expert leader among the bogs and fens.

The meeting on August 18 was a memorable one, when 35 members visited Frampton-on-Severn, with its historical homes, beautiful village green and its section of the Sharpness and Gloucester Canal. Arriving at 3.0 p.m. we were welcomed at Frampton Court, a fine old mansion with interesting stone carvings, by Colonel Miller, who conducted us round his garden, showing us the vinery, herbaceous borders and swimming pool. The grounds comprise about 60 acres, and the house is situated with a fine view towards the Cotswold Hills. We next visited the Manor Farm or Mansion House, which was on the other side of the Green and dates from the 11th Century. Standing on the well-kept lawns and looking at the wonderfully preserved timbering, one could definitely feel the atmosphere which surrounded this building. The Doctor's house, which was next to the Manor, was another interesting building, and, after conducting us round the garden, Colonel Miller took his leave of us. After tea, members paid a visit to Frampton Church (St. Mary's), part of which was built in 1315, and a pleasant walk was taken along the canal tow-path as far as the junction bridge. The canal is fed by water from the Stroud Valley and, in times of drought, water is pumped from the River Severn to maintain the statutory level. The canal was built to avoid the dangers of navigation in the River Severn between Sharpness and Gloucester, and reduced the distance between these two points by 12 miles, providing not only a safe route but one available at all times. At present, barges carrying about 400 tons of petroleum products navigate regularly through the canal. Fishing rights were reserved to the Lords of the Manor—roach, bream, dace, pike and eels are to be found in the canal. We were indebted to Mrs. H. H. Davis for the detailed account of the architecture and history of Frampton and to Mrs. G. S. Wakefield for the history and uses of the Sharpness and Gloucester Canal.

The last meeting was held on Saturday, Sept. 8, when a visit was made to the Quantock Hills and Blue Anchor under the leadership of Mr. and Mrs. A. C. K. Fear. Two coaches carrying 54 people left Bristol at 9.0 a.m. and proceeded to Holford Glen, via Bridgwater and Nether Stowey. At Holford, Old Red Sandstone fossils were collected and botanists found many plants to interest them. The party then walked up Hodder's Combe and had a picnic lunch in Bircham Wood, where trees had been felled during recent years. After lunch the party walked up Sheppard's Combe, where many interesting fungi were observed, and eventually reached Bicknoller Post, where the heather and gorse were in full bloom. The party descended Bicknoller Combe and it was then that rain began to fall rather heavily so that the party was unable to observe the bird-life in this valley. The time thus gained was spent in Bicknoller Church, which dates back to the 15th century. The screen and bench-ends are particularly fine. The party then rejoined the coaches and proceeded to Blue Anchor for tea. The fine cliff-section in Trias and Rhætic rocks was examined after tea, and many fossils and specimens of gypsum were collected. Other members of the party examined the rock-pools, and several brittle stars were found. On the return journey a brief halt was made at Carhampton Church, where members were shown the painted screen.

E. J. VINNICOMBE, *Hon. Secretary*
G. S. WAKEFIELD, *Hon. Secretary, Field Committee*

BRISTOL BOTANY IN 1951

By Cecil I. and N. Y. Sandwith

(*Received Feb. 11, 1952. Read in title at General Meeting, March 6, 1952*)

THE year 1951 was remarkable for its rainfall and unsettled weather. It cannot be said that the winter was a hard one for, although there were slight snow-storms at intervals, the snow did not stay on the ground and the frost was not serious. The spring was late in coming. January, February and March were months of rain. There was a snow-storm in April and there were also thunderstorms and heavy rain, but from the 16th to the 26th the weather became warm and sunny and the surface of the ground was dried hard by cold winds. May was cold, with some hail and snow. There were periods of warm, sunny weather in June and July, but there was no real summer and thunderstorms were frequent. August and September were unsettled. October was a brighter month, but did not give its usual brilliance to the landscape. The year was disappointing !

We have received some excellent records from a number of contributors. In particular, Miss E. Rawlins, who, in the past, has been a visitor to the Bristol district, has sent many interesting notes from the neighbourhood of Shipham, on Mendip, where she has come to live. Contributors are asked to send in their records by Christmas or, at the latest, by January 1. Voucher specimens of interesting or critical species and varieties should always be collected and pressed.

Ranunculus Lingua L. Pond, Portbridge Mill, Chew Magna parish, **S.**, *T. H. Payne.*

Rorippa × *sterilis* Airy Shaw (*Nasturtium microphyllum* Boenn. ex Reichb. × *officinale* R.Br.). Siston Common, **G.**, *C. C. Townsend.* Thornbury, **G.**, *I. W. Evans*, det. *Airy Shaw.*

Sisymbrium officinale (L.) Scop. var. *leiocarpum* DC. Near the Chequers Inn at Hanham Ferry, **G.**, *C. C. Townsend.*

Hirschfeldia incana (L.) Legr.-Foss. A flourishing colony of this species was met with last summer among the sand dunes N. of Berrow church, **S.**, by *C.I.S.* and *N.Y.S.*, and is likely to persist.

Silene anglica L. Loxton Hill, **S.**, *Miss E. Rawlins.* Always a rare species in our area.

Melandrium noctiflorum (L.) Fr. Cultivated ground, Loxton Hill, **S.**, *Miss E. Rawlins.*

Hypericum hirsutum L. A form with very pale, almost sulphur-coloured, flowers has been found in several counties and has recently been recorded from Shute Shelve Hill, **S.**, see *Rep. Bot. Sect. Som. Arch. and Nat. Hist. Soc.* for 1948–9.

Linum bienne Mill. Limestone bank, Churchill Batch, **S.**, 1916, *T. H. Green* and *C.I.S.*, and still there.

Geranium pusillum L. Loxton Hill, **S.**, *Miss E. Rawlins.*

Trifolium incarnatum L. Border of cultivated field, Sidcot, **S.**, *Miss E. Rawlins.*

Vicia Orobus DC. Slope on Mendip at Priddy, **S.**, *I. W. Evans.*

V. sylvatica L. Between Shipham and Star, **S.**, *John Barlow.*

Lathyrus Nissolia L. Rough pasture on Mendip near Tyning's Farm, **S.**, about 1939, *Miss M. Ashby* and *Miss E. Rawlins.*

Comarum palustre L. The record from dune-marsh N. of Berrow church, **S.**, (see " Bristol Botany in 1950 "), must be deleted. Large leaves of a luxuriant form of *Potentilla reptans* were mistaken for *Comarum* on an autumn day. When the locality was revisited in summer, this unfortunate error became painfully obvious.

Sorbus torminalis (L.) Cr. Wooded slope of Court Hill, Clevedon, **S.**, *I. W. Evans.*

Pyrus communis L. var. *sativa* Lam. et DC. A small tree by the Avon under Cook's Folly, **G.**; and another on the roadside on the hill above the Failand Inn, **S.**, *C.I.S.*

Cotoneaster frigida Lindl. Woods at Mells, **S.**, July, 1932, *I. W. Evans.* A native of the Himalayas, often cultivated in this country.

Sedum spurium M. Bieb. Several patches are well established at the foot of St. Vincent's Rocks below the Suspension Bridge, **G.**, *I. W. Evans.*

Callitriche truncata Guss. var. *occidentalis* (Rouy) Druce. Rhine N.W. of Kingston Seymour towards Treblehouse Farm, **S.**, *C.I.S.* and *N.Y.S.* Discovered in September, when the plant was fruiting well and occurred in distinct patches for a distance of many yards. This is a welcome discovery, since the evidence for the existence of this very local species within our area rested on Mr. H. S. Thompson's record from the Sharpham Moor plot, see " Bristol Botany in 1923 " and *Journal of Botany*, 1923, p. 314. His specimen in Herb. White, gathered on August 9, 1923, is correctly named, but we are not aware that any other botanist has since seen the plant in this locality, although Mr. Thompson himself submitted some rather doubtful, sterile specimens, from a rhine on Sharpham Moor, to the Watson Exchange Club in 1930.

Epilobium adenocaulon Hsskn. × *parviflorum* Schreb. Weston-in-Gordano moor, **S.**, *C.I.S.* and *N.Y.S.*, det. *G. M. Ash.*

Petroselinum crispum (Mill.) Nym. Hedgebank, Axbridge, **S.**, *Miss E. Rawlins.*

Œnanthe pimpinelloides L. Abundant in a pasture near Brent Knoll station, **S.**, *C.I.S.* and *N.Y.S.*

Viburnum Tinus L. Thoroughly established and increasing on a steep slope of St. Vincent's Rocks above Bridge Valley Road, **G.**, and with outlying bushes in the adjacent woodland, this species is a conspicuous sight in spring and well deserves its first mention.

Chrysanthemum Leucanthemum L. A remarkable form with the ray ligules converted into tubular florets was found in June on the rubbish heap of a disused mine at Camerton, **S.**, by *Miss Janet Greenland*, of Colston's Girls' School. Specimens were sent to the Kew Herbarium and are preserved there. The finder reported that the form occurred among many normal plants, and a single specimen was found which seemed to be intermediate. For the previous discovery of this form in another locality in our area, at Alveston, **G.**, see *Journal of Botany*, 1918, p. 43.

Senecio viscosus L. Disused railway line, Wrington, **S.**, *Miss E. Rawlins.*

S. Jacobaea L. var *discoideus* L. Whitchurch, **S.**, *I. W. Evans.*

Carduus tenuiflorus Curt. Loxton Hill, **S.**, *Miss E. Rawlins.*

Cirsium eriophorum (L.) Scop. subsp. *britannicum* Petrak. Railway bank, Wrington, **S.**, *Miss E. Rawlins.*

Lactuca Serriola L. Cart-track below Axbridge, **S.**, *Miss E. Rawlins* (specimen verified).

Centunculus minimus L. By the stream in Winterhead Bottom on Mendip, **S.**, *Miss E. Rawlins.* Only two specimens were seen. This is the fourth station for this species in our area.

Gentiana Amarella L. Loxton Hill, **S.**, *Miss E. Rawlins.*

Cynoglossum officinale L. Loxton Hill, **S.**, *id.*

Cuscuta Epithymum L. Rough pasture on Mendip near Shipham, **S.**, 1941, *John Barlow.*

Datura Stramonium L. Orchard at Chew Stoke, **S.**, *T. H. Payne.*

Verbascum virgatum Stokes. Kewstoke, 1913, *H. F. Devis*; and Bath, **S.**, 1916, *T. H. Green*; specimens from both localities are in the Kew Herbarium and were identified by the late Dr. S. Murbeck. Spoil banks between Sandford Quarry and the railway station; and on the wall of a cottage garden at Axbridge, **S.**, *Miss E. Rawlins.*

Linaria Cymbalaria (L.) Mill. A patch with white flowers on a stone wall at Shepton Mallet, **S.**, *J. P. M. Brenan.*

Stachys arvensis L. Mr. White noted this species as common, and gave no localities. At the present day this treatment would seem unjustified, for *S. arvensis* is not often found. This summer it was noted at Tickenham, **S.**, by *C.I.S.*, and on Loxton Hill, **S.**, by *Miss E. Rawlins.*

Lamium album L. forma *erubescens* Wats. ex C. E. Salmon, *Fl. Surrey*, p. 535. Near Berrow church, **S.**, 1949, see the Year Book for 1951 of the Botanical Society of the British Isles, p. 39, as " a form with a pink upper lip to the corolla ". It is probably not uncommon.

Plantago lanceolata L. var. *anthoviridis* W. Wats. This curious form has been observed on the Berrow dunes, **S.**, 1949, by members of the Botanical Society of the British Isles, *loc. cit.*, p. 38; and by ourselves in an orchard at Tickenham, **S.** It will probably prove to be common, although not previously recorded. For an article on variation in the androecium of *P. lanceolata*, see J. F. Hope-Simpson in *Journal of Botany*, 1939, pp. 290–293.

Chenopodium polyspermum L. Turnip field on the edge of Rowberrow Warren; and in a garden at Winscombe, **S.**, *Miss E. Rawlins.*

C. ficifolium Sm. Near Stone, **G.**, *C. C. Townsend.*

C. murale L. Loxton Hill, **S.**, in two spots, *Miss E. Rawlins.*

Euphorbia platyphyllos L. Disused railway embankment at Wrington, **S.**, *id.*

Allium oleraceum L. Two colonies in lanes near Shipham Broadway, *Miss E. Rawlins*; and rocky roadside at Sidcot, **S.**, *Miss M. Ashby.*

Asparagus officinalis L. Railway bank, Axbridge, **S.**, *Miss E. Rawlins.*

Polygonatum multiflorum (L.) All. Priest Wood, between Cromhall and Milbury Heath, **G.**, *Dr. David Prowse.*

Juncus tenuis Willd. Along a track on Siston Common, **G.**, *C.I.S.* and *N.Y.S.*

Sparganium neglectum Beeby. With *S. erectum* L. in a rhine near Kenn Moor Gate, **S.**, *C.I.S.* and *N.Y.S.*

Wolffia arrhiza (L.) Wimm. Rhines below Axbridge, **S.**, with the four other Duckweeds, *Miss E. Rawlins.*

Alisma lanceolatum With. In the Avon at Hanham Ferry ; and in a roadside pond at Falfield, **G.**, *C. C. Townsend.*

Scirpus Tabernaemontani Gmel. Rhine on Weston-in-Gordano moor, **S.**, *C.I.S.* and *N.Y.S.*

Carex demissa Hornem. × *serotina* Mérat. This hybrid was identified on Shapwick peat moor, **S.**, by *Miss Elizabeth Davies*, who reported that she had failed to find true *C. serotina* in the enclosure to which we had directed her. In August we joined her on another visit to this spot, and a long search disclosed only a very small quantity of *C. serotina* among many tufts of hybrids which varied considerably towards one or other of the parents and may have included back-crosses. A selection of specimens was reported on by Mr. E. Nelmes, who has also identified as this hybrid some specimens gathered by us on the moor below Mudgley, in August, 1947. It remains to be seen whether hybrid populations are gradually ousting *C. serotina* from its peat moor stations.

C. distans L. × *extensa* Good. In an article in *Watsonia*, ii, pp. 148–150 (1952), on the occurrence in Britain of this hybrid, Mr. Nelmes rejects both the forms from Berrow salt-marsh, **S.**, which were referred here in " Bristol Botany in 1946 ". He considers that the specimens of the first form (Ref. A) are a mixed gathering of *C. distans* and *C. extensa*, while those of the second (Ref. B) are robust plants of *C. distans.*

C. hirta L. A curious form with compound female spikes (= *Trasus hirtus* (L.) S.F.Gr. var. *compositus* S.F.Gr.) has been collected at the Rockies, near Falfield, **G.**, July, 1936, by *Mr. I. W. Evans*, and occurred in quantity this summer round a pool in the sand-dunes N. of Berrow church, **S.**, where it was noticed independently by both Mr. Evans and ourselves. Mr. Nelmes, who examined the specimens, regards this form as a reversion towards an ancestral type and thinks this condition is commoner in *C. hirta* than in other British sedges.

Glyceria × *pedicellata* Towns. Nailsea and Tickenham moors, **S.**, 1940, *C.I.S.* and *N.Y.S.*, det. *C. E. Hubbard.*

G. declinata Bréb. Pond on Siston Common, **G.**, *C.I.S.* and *N.Y.S.*, confirmed by *C. E. Hubbard.*

Dryopteris Borreri Newm. On sandstone in Leigh Woods, **S.**, *P. Taylor.*

D. dilatata (Hoffm.) A. Gr. Goblin Combe, **S.**, *P. Taylor.*

Polystichum aculeatum (L.) Roth and *P. setiferum* (Forsk.) Woynar were both collected in Goblin Combe, **S.**, by *P. Taylor.*

Aliens. Some additions to the Bristol adventive flora are listed separately. At Avonmouth Docks, **G.**, we found a fine plant of *Erucaria hispanica* (L.) Druce, and saw that *Pimpinella major* (L.) Huds. had survived to a second season. *Mr. I. W. Evans* noted *Xanthium spinosum* L. and *Amaranthus albus* L. in Newfoundland Road, **G.**; *Salsola pestifera* A. Nels. at Wapping Wharf, **G.**; and *Colutea arborescens* L. and *Lathyrus latifolius* L. by the Cut, Coronation Road, **S.** New garden outcasts observed by him on the Portway tip, **G.**, were *Lobelia Erinus* L., the pink-flowered form of *Calystegia sylvestris* (Willd.) R. et S., and *Celsia cretica* L., while garden forms of *Thalictrum minus* L. and *Geranium pratense* L. have also been seen there. *Polygonum cuspidatum* Sieb. et Zucc. is, of course, on the increase: Mr. Evans had it at Arno's Vale, **S.**, in 1945, and we saw it this summer in Portishead Dock, **S.** *Galinsoga ciliata* (Raf.) Blake is spreading in Bath, **S.**, further localities having been reported by Mr. Evans and by *Miss A. L. Miller.*

Vaccaria pyramidata Medik var. *grandiflora* (Fisch.) Čelak. Portway tip, **G.**, *C.I.S.* A large-flowered variety, no doubt a garden outcast here, but not previously noted.

Oxalis corniculata L. Portway tip, **G.**, Oct., 1937, *C.I.S.* Strangely enough, a first record for the Bristol adventive list.

Cerinthe minor L. var. *hispida* Turrill. Portway tip, **G.**, 1950, *I. W. Evans.* The variety has not previously been recorded.

Nepeta Mussinii Spr. A garden escape, found by *C.I.S.* on the Portway tip, **G.**, and by the late Dr. G. C. Druce at " Bristol " in 1928, see *Watsonia*, ii. p. 108 (1951).

N. × *Faasenii* Bergmans ex Stearn. This hybrid is now more often cultivated than its parents, *N. Mussinii* and *N. Nepetella.* It has been recorded from Weston-super-mare, **S.**, 1922, *R. L. Smith*, see *Watsonia*, loc. cit., where Dr. D. P. Young gives useful notes on these two plants.

Panicum effusum R. Br. Ashton Gate tip, **S.**, Oct., 1941, *C.I.S.*, det. *C. E. Hubbard.* An Australian species.

Mosses. *Mnium undulatum* L. Although a common moss, this is rarely found in fruit. There were, however, abundant capsules on a fallen tree-trunk in Whatley Combe, **S.**, on April 15, *J. P. M. Brenan.*

ORNITHOLOGICAL NOTES, BRISTOL DISTRICT, 1951

Compiled from Reports of Members of the B.N.S. Ornithological Section

By H. H. Davis, M.B.O.U.

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THIS issue, covering the more important observations for 1951, is, for the most part, the result of contributions by thirty-nine members. Records of special note include those of a Pied Flycatcher at Brean Down in late October ; Black Redstarts in the Weston-super-Mare area in January and March, and at Long Ashton in April ; a Bluethroat at the New Grounds in April ; a Hoopoe in a Brentry garden in August ; and a Hen-Harrier at the New Grounds in November. Fulmar records from Steep Holm at once suggest that the bird's remarkable spread southward in Britain is now affecting the upper reaches of the Channel and the mouth of the Severn. Other noteworthy reports are of a Grey Phalarope at Severn Beach in September ; an Iceland Gull on the Avon in May ; a Little Crake at the New Grounds in April ; and a Quail at Aust in August.

Among important records from the North Somerset reservoirs are those of a Bittern at Blagdon in January ; a Whooper Swan at Cheddar in January ; Gadwall at Blagdon in September and December ; and Garganey at the same place in March and April. Common Scoters were reported from Blagdon in January and July, and from Cheddar in September, while Goosanders and Smew were present early in the year at Barrow Gurney, Blagdon and Cheddar. A count of over 2,000 duck at Blagdon on December 16 was made up of no less than twelve species : Sheld-Duck (1), Mallard (222), Gadwall (2), Teal (293), Wigeon (1,256), Pintail (4), Shoveler (4), Pochard (131), Tufted Duck (113), Scaup (1), Goldeneye (9), and Smew (4). Great Northern Divers made a prolonged stay at Cheddar in November-December, and a Red-throated Diver spent a few days on the same reservoir in the first half of March. Interesting wader records are of Common Sandpipers in winter at Barrow Gurney and Cheddar ; a Wood-Sandpiper at Blagdon in September ; and Spotted Redshanks at Blagdon on both spring and autumn migration. From Cheddar there are reports of Sandwich Terns in September and Little Terns in May and September.

Observations at the New Grounds showed that White-fronted Geese totalled well over 3,000 throughout much of January and February, and that Pink-footed Geese in autumn, though again comparatively few, arrived in rather larger numbers than in any year since 1947. Records of particular note are of Greenland White-fronts (two family parties) ; Lesser White-fronts (four adults and two immatures) ; and single examples of Bean-Goose, Barnacle-Goose and Brent.

The rapid increase of the Common Buzzard continues on both sides of the city. In North Somerset successful breeding has been reported from Churchill and Portbury, and there is evidence of nesting for several years past at Hutton, near Weston-super-Mare. Buzzards (sometimes several together) have again been reported from such Cotswold areas as Dyrham and Wotton-under-Edge, and it seems likely that the species is now breeding in South Gloucestershire.

The following members have contributed :—A. E. Billett, Rev. F. L. Blathwayt, H. J. Boyd, Col. G. A. Bridge, Miss M. E. Bridge, L. F. Burroughs, G. C. Buxton, Mrs. G. C. Buxton, Miss K. M. Cary, P. J. Chadwick, Miss G. G. Clements, G. E. Clothier, R. V. Culverwell, H. H. Davis, Mrs. H. H. Davis, E. E. Dunn, H. Dunnicliff, Miss P. Farmer, R. G. Hamilton, L. W. Hayward, B. King, G. A. Knight, A. C. Leach, D. R. Lovell, N. W. Moore, H. W. Neal, P. F. O'Neil, Rev. E. W. Plowright, R. H. Poulding, Peter Scott, R. A. Skinner, W. R. Taylor, M. Tucker, Miss D. Turner, D. I. T. Walker, Miss C. A. L. Wareham, Miss F. Wareham, H. F. Webb and R. F. Wills. Non-member contributors are Mrs. R. Barnes, S. T. Johnstone, D. Lea, D. F. McKinney, W. L. Roseveare and J. Yealland. Records are followed with appropriate initials and, unless otherwise stated, refer only to 1951.

G. = South Gloucestershire. **S.** = North Somerset.[1]

RAVEN *Corvus corax*

G. One (or two), Avon Gorge, Jan. 6, but no subsequent evidence of breeding (R.H.P.). Two, New Grounds, Dec. 16 (D.L.).

S. Bred Sand Point and, almost certainly, Brean Down (W.L.R.). Eyrie, north cliffs, Steep Holm, Mar. 23 (R.H.P.). Birds reported from Sand Point and Woodspring Bay, various dates outside breeding season (G.A.B., M.E.B., G.E.C. *et al.*).

CARRION-CROW *Corvus corone*

G. Albino fledgling in brood of two, Patchway in May ; plumage entirely white, eyes pink, legs yellowish-white (H.H.D.).

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[1] A more complete list of records for North Somerset will be given in the 1951 *Report on Somerset Birds*.

S. Counts of well over 100 on mud-banks, Avon Gorge, three occasions in Aug. (R.H.P.).

STARLING *Sturnus vulgaris*

G. Immense numbers roosting, Faggot Pile Covert, Acton Turville, Jan.–Mar. ; roost, reported as having formed up in previous Oct., still at full strength in mid-Mar., but broke up shortly afterwards and did not re-form in autumn (H.H.D.).

S. Small roost, max. 3,500 or more, in Plane trees, Coronation Road (nr. Bedminster Bridge), Oct.–early Nov. (P.J.C.).

HAWFINCH *Coccothraustes coccothraustes*

G. Single birds, Durdham Down, Clifton, Apr. 4, and Zoological Gardens on 5th (R.H.P.). One, New Grounds, Nov. 28 (H.H.D.).

CORN-BUNTING *Emberiza calandra*

G. Plentiful, Marshfield area, in breeding season (D.T.). One singing from stone wall, Downend, various dates, June–early July, but no evidence of nesting (R.H.P.). Several, Leighterton, Aug.–Sept. (H.F.W.).

CIRL BUNTING *Emberiza cirlus*

G. Again nested (2 or 3 pairs), Durdham Down, Clifton, where also present in winter (R.H.P.). Two, Beverston, nr. Tetbury, June 10 (H.F.W.).

S. Breeding season records from Cleeve (G.E.C.), Compton Bishop (R.H.P.) and Portishead (P.F.O'N.).

TREE-SPARROW *Passer montanus*

G. Reported in breeding season from Hallen Marsh (K.M.C., C.A.L.W., F.W.) ; Oldbury-on-Severn (D.I.T.W.) ; and New Grounds (R.H.P.).

WOOD-LARK *Lullula arborea*

G. Again nested, North Nibley, where two adults and three fledged young seen, July 8 ; birds noted, same area, various occasions in winter (E.E.D., H.F.W.).

S. Pair and two fledged young, Backwell Hill, June 2 (D.I.T.W.). Breeding season records, various localities, including Long Ashton (D.I.T.W.) ; Cleeve (G.E.C.) ; Crook Peak (P.J.C.) ; Bleadon Hill (A.E.B.) ; and Wrington (G.C.B.). Four, with other migrating passerines, Brean Down, in early morning, Oct. 28 (A.E.B., P.J.C., H.W.N.).

ROCK-PIPIT *Anthus spinoletta petrosus*

S. Two, presumably of this form, with Meadow-Pipits, Cheddar res., Oct. 11 (B.K.).

YELLOW WAGTAIL *Motacilla flava flavissima*

S. One, during watch for migrating passerines, Brean Down, on unusually late date of Oct. 28 (A.E.B., P.J.C., H.W.N.).

PIED WAGTAIL *Motacilla alba yarrellii*

S. Large winter roost on glass roof, W. D. & H. O. Wills' No. 1 factory, Bedminster ; max. count of birds coming in, 762, Dec. 7 (P.J.C.).

RED-BACKED SHRIKE *Lanius collurio*

S. Male, Cheddar res., May 14 and June 10 (B.K.). Probably bred, Backwell area, where pair seen, June 17 ; female, same place, July 15, and female and a juvenile, Aug. 19 (G.C.B.).

PIED FLYCATCHER *Muscicapa hypoleuca*

G. Single males, Pucklechurch, Apr. 16 (F.L.B.) ; Bishopston, 21st ; Sea Mills, May 20 (H.W.N.). Single females, Durdham Down, Clifton, May 2 (N.W.M.) ; Dyrham, 8–10th (F.L.B.).

S. Single males, Leigh Woods, Apr. 16 (P.J.C.) ; Ston Easton and Tickenham, 21st (G.G.C., Mrs. H.H.D., D.I.T.W.) ; Leigh Woods and Nailsea Moor, May 6 (P.J.C.). Female, Pill, Apr. 21 (N.W.M.). One, identified as a male, Brean Down, on exceptionally late date of Oct. 28 (A.E.B., P.J.C.).

GOLDCREST *Regulus regulus*

S. One, Steep Holm, Mar. 23 ; first record for the island (R.H.P.).

GRASSHOPPER-WARBLER *Locustella naevia*

G. Heard, Shirehampton, Apr. 25 (P.J.C.), and nr. Severn Beach, May 14 (H.H.D.).

S. Reported, May–June, from Long Ashton (D.I.T.W.) ; Belmont Hill (G.E.C.) ; Kingston Seymour (D.I.T.W.) ; Nailsea Moor (P.J.C.) ; and Leigh Woods, where R.V.C. located 15 singing males.

WHINCHAT *Saxicola rubetra*

G. Three, May 3, Durdham Down, Clifton, where the species has not previously been noted (R.G.H., A.C.L.).

BLACK REDSTART *Phoenicurus ochrurus*

S. Single females or immatures, Weston-super-Mare (promenade), Jan. 2, and Sand Point, Mar. 20 (W.L.R.). Male, Long Ashton, Apr. 28 (G.E.C., D.I.T.W.).

RED-SPOTTED BLUETHROAT *Luscinia svecica svecica*

G. Male seen at close range in hawthorn hedge bordering the sea-wall, New Grounds, Apr. 15. The observer, Mr. M. Everitt, not having heard of Bluethroats, described it as ' a robin with a blue breast with a red spot in the middle'. No other characters were given and the bird was not seen again. This is the first reported occurrence for the district and, despite the somewhat early date and the lack of more complete details, it appears evident, from the diagnostic character mentioned, that the observation can have referred only to *L. svecica* (cf. *Rep. Severn Wildfowl Trust*, 1950–51, p. 28).

WREN *Troglodytes troglodytes*

S. A bird, with ring, recovered at Brislington, Jan. 25, had been ringed as a nestling, Sibford Ferris, Oxon. (67 miles N.E.), May 26, 1949. This is one of only two recoveries from any considerable distance yet recorded for the species in Britain (*Brit. Birds*, XLIV, p. 296).

DIPPER *Cinclus cinclus*

G. One, Little Avon, nr. Kingswood (Wotton-under-Edge), Aug. 5 (R.H.P.).

SWALLOW *Hirundo rustica*

S. Six, Blagdon res., Mar. 31 (W.R.T.).

NIGHTJAR *Caprimulgus europaeus*

G. Seen or heard, Westridge Wood, North Nibley, several occasions, mid-June (E.E.D., H.F.W.).

S. Twelve pairs identified, Forestry Commission clearings, Leigh Woods, but total breeding population perhaps 20 or more pairs; nest with young, June 28 (R.V.C.). Nest with egg, Portbury, July 25 (A.E.B.). Breeding season records from Long Ashton (D.I.T.W.); Belmont Hill (G.E.C.); and Bleadon Hill (W.L.R.).

HOOPOE *Upupa epops*

G. One paid a short visit to a lawn at Brentry, Aug. 24 (*Western Daily Press*, 28.8.51).

LESSER SPOTTED WOODPECKER *Dryobates minor*

G. Single birds, North Nibley, May 31 (H.F.W.); Westbury-on-Trym, July 28 (R.V.C.); and Stoke Bishop, Dec. 16 (R.G.H.).

S. One, Blagdon, Mar. 4 (B.K.).

SHORT-EARED OWL *Asio flammeus*

G. One, New Grounds, Sept. 4, Oct. 17 (H.J.B.).

PEREGRINE FALCON *Falco peregrinus*

G. One, Avon Gorge, various dates, Jan., Sept.–Dec. (R.H.P.); two, same place, Nov. 25 (K.M.C.). Single birds, Stoke Gifford, Aug. 30 (H.H.D.); New Grounds, Oct. 17 (H.F.W.); North Nibley, Oct. 25, Nov. 11 (E.E.D., H.F.W.); and Henleaze, mid-Nov. (A.E.B.).

S. One, Steep Holm, various occasions, May–June, but no direct evidence of breeding (H.H.D., R.H.P.). One, St. George's Wharf, Jan. 15, and two, Aug. 5 (A.C.L.). Single birds, Brean Down, Feb. 15 (W.L.R.); Bedminster, Mar. 11 (R.V.C.); Blagdon, Apr. 15 (A.E.B., R.H.P.); Saltford, July 15 (B.K.); Pill, Nov. 18 (R.H.P.), and Axe Estuary, 22nd (W.L.R.). Two, Yeo Estuary, Sept. 30, and one, Dec. 30 (W.L.R.).

HOBBY *Falco subbuteo*

G. Two, New Grounds, May 7 (S.T.J., J.Y.). Two, Codrington, and one between same place and Dodington, Aug. 5 (R.H.P.). Single birds, Shirehampton, Aug. 14 (H.W.N.); Little Stoke, several dates, late Aug. (H.H.D.); and Dyrham, several occasions, Aug.–Sept. (F.L.B.).

S. One, Lansdown, Bath, Aug. 24 (A.C.L.).

MERLIN *Falco columbarius*

G. Single ad. males, New Grounds, Apr. 12 (D.F.McK.); Nov. 18 (H.J.B.).

KESTREL *Falco tinnunculus*

G. Pair bred successfully on aperture ledge, Tyndall's Monument, North Nibley (E.E.D., H.F.W.).

COMMON BUZZARD *Buteo buteo*

G. Again reported from widely separated localities. One, sometimes two, Westridge Wood and Wotton-under-Edge, various dates, Jan.–Aug.; four over North Nibley, Sept. 28 (E.E.D., H.F.W.). One or more, Dyrham Wood area, frequently, summer and autumn (F.L.B.). Single birds, Thornbury Meads, Oct. 27 (H.H.D.); Badminton, Dec. 26 (R.B.).

S. Observations confirm that the species is now well established. Nest with four young, Churchill, June 26, and another with three, Portbury, on 29th; young ringed at both eyries (A.E.B.). Probably bred in a wood at Hutton; local keeper states that a pair has nested in same wood for past five years (W.L.R.). Three, Hunstrete, Mar. 24 (B.K.). Four together, Crook Peak, Apr. 15 (A.E.B., P.J.C., R.H.P.), and three, Sept. 22 (G.G.C., C.A.L.W., F.W.). Seen, singly or in twos, in other widely separated areas (various observers).

HEN-HARRIER *Circus cyaneus*

G. Adult male, New Grounds, Nov. 10; bird seen in flight by H.J.B., who has supplied conclusive details.

COMMON HERON *Ardea cinerea*

S. Thirty-six occupied nests, Brockley Combe, Apr. 28—an increase of 13 over 1950 total (B.K., M.T.).; 24 occupied nests, Uphill Grange, May 2 (W.L.R.). Banwell Heronry, more or less deserted owing to tree-felling, had only two nests in use, May 14 (L.F.B., G.E.C.).

BITTERN *Botaurus stellaris*

S. One, Blagdon res., Jan. 7, and one, no doubt the same, on 21st; when first seen the bird was in full view on reservoir car-track (G.C.B., B.K.). One put up from ditch within a few miles of the city, July 15—an unusual date (N.W.M.).

WHOOPER SWAN *Cygnus cygnus*

S. Immature bird, Cheddar, res., Jan. 21 (B.K.).

WHITE-FRONTED GOOSE *Anser albifrons albifrons*

G. Maximum number, New Grounds, early in year—*c.* 3,700, Jan. 27; total continued at well over 3,000 to third week of Feb., thereafter decreasing rapidly. Last seen—14, Mar. 21. First autumn arrivals were 27, Sept. 30, but over 300 by Oct. 2; subsequent steady increase to *c.* 1,870, Dec. 26 (H.J.B., D.F.McK., P.S.).

S. Party of 11, St. George's Wharf, Jan. 12 (A.C.L.), and a single immature, same place, Mar. 21 (R.H.P.), were doubtless birds of the typical form.

GREENLAND WHITE-FRONTED GOOSE *Anser albifrons flavirostris*

G. Family party of six (first seen previous Nov.), Jan. 1–11, and another of five, Feb. 1–23 (H.J.B., P.S.).

LESSER WHITE-FRONTED GOOSE *Anser erythropus*

G. No fewer than six (4 ads. and 2 imms.) identified among common White-fronts at New Grounds. First adult present, Jan. 1–13; another seen Feb. 17, and a third from 20–25th. A fourth adult, observed Mar. 18, had a damaged leg, and was subsequently found among captive geese in S.W.T. enclosures, where it remained until late May. Of two first winter immatures seen Jan. 26, one was still present, Feb. 19 (H.J.B., P.S.).

BEAN-GOOSE *Anser fabalis*

G. One, immature, New Grounds, Oct. 2–26 (H.J.B., P.S.).

PINK-FOOTED GOOSE *Anser brachyrhynchus*

G. New Grounds: small parties of up to six, various dates, early Jan. to mid-Mar. First autumn arrivals—23, Oct. 13. Highest count—120, Oct. 26, but subsequent gradual decrease to 32, Nov. 18; thereafter only two for remainder of year (H.J.B., H.H.D.).

BARNACLE-GOOSE *Branta leucopsis*

G. One, New Grounds, Jan. 1–11 (H.J.B., P.S.).

DARK-BREASTED BRENT GOOSE *Branta bernicla bernicla*

G. Single bird, New Grounds, Oct. 15–27 (H.J.B., P.S.).

SHELD-DUCK *Tadorna tadorna*

G. Highest counts on Estuary, New Grounds—210, Apr. 24, and 213, July 20 (H.J.B.).

S. Single birds, Blagdon res., Feb. 11, Dec. 16, 30 (G.C.B., P.J.C., B.K.). Highest totals reported from coast—337, Axe Estuary, Oct. 25, and 285, Sand Bay, Nov. 22 (W.L.R.).

MALLARD *Anas platyrhyncha*

G. Autumn numbers on Estuary, New Grounds, much below 1950 totals; highest count, 1,100, Dec. 1 (H.J.B.).

S. Maximum counts at reservoirs—543, Blagdon, Sept. 16 (B.K.), and in coastal areas—670, Sand Bay, Feb. 9 (W.L.R.).

GADWALL *Anas strepera*

S. Two males, Blagdon res., Sept. 30 (P.J.C., B.K.); pair, same place, Dec. 16 (P.J.C., B.K.), 26 (H.H.D.).

TEAL *Anas crecca*

G. Largest numbers on Estuary, New Grounds—1,100, Feb. 16; 960, Mar. 11, Dec. 1 (H.J.B.).

S. Highest counts at reservoirs—1,006, Blagdon, Jan. 7; 950, Cheddar, Feb. 4 (B.K.), and in coastal areas—480, Sand Bay, Mar. 20; 400, Clevedon Bay, Dec. 2 (W.L.R.).

GARGANEY *Anas querquedula*

G. Male, New Grounds decoy pool, May 5, June 9 (S.T.J., P.S.).

S. Pair, Blagdon res., various dates, Mar. 25–Apr. 29 (P.J.C., B.K., R.H.P.). Male, Nailsea Moor, Apr. 28; pair, same place, May 6 (P.J.C.).

WIGEON *Anas penelope*

G. At least 1,175 on Estuary, New Grounds, Nov. 16; probably more in Dec. (H.J.B.).

S. Unusually large numbers, Blagdon res.; max. counts of 942, Jan. 21; 623, Feb. 11; 725, Dec. 2; and 1,256, Dec. 16—a record total (P.J.C., B.K.).

PINTAIL *Anas acuta*

G. Ninety on Estuary, New Grounds, Feb. 6 (P.S.), and 70, Dec. 17 (H.J.B.).

S. Reservoir records: 12, Blagdon, Jan. 29 (W.L.R.), and up to nine or ten, various dates, Sept.–Dec. (G.C.B., H.H.D., B.K.); two, Cheddar, Jan. 27, Oct. 7 (P.J.C., B.K.); and four, Barrow Gurney, Feb. 18 (D.I.T.W.). Eight, Kenn Moor, Apr. 23 (H.D.), and a pair, Nailsea Moor, 28th (P.J.C.). One hundred and seventy-three, largest count yet from coast, Sand Bay, Feb. 11 (B.K.). Ten, Clevedon Bay, Mar. 5 (W.L.R.).

SHOVELER *Spatula clypeata*

S. Highest reservoir total—76, Cheddar, Jan. 21 (B.K.). Ninety, an unusually large coastal count, Sand Bay, Feb. 11 (B.K.). Twenty, Nailsea Moor, May 6 ; two nests with eggs (both deserted), same place, May 14 (P.J.C.). Female with well-grown young, Weston Moor, June 14 (A.E.B., R.H.P.). Fifty or more, Clevedon Bay, Dec. 30 (W.L.R.).

COMMON POCHARD *Aythya ferina*

S. About 300, Cheddar res., several dates, Jan. and Nov.–Dec. ; no large numbers elsewhere (B.K.).

TUFTED DUCK *Aythya fuligula*

S. Plentiful, Blagdon res., Jan., Oct., and Cheddar res., Feb. ; max. count—443, Blagdon, Oct. 28 (B.K.).

SCAUP *Aythya marila*

S. Up to four, males and females, Blagdon res., various dates, Jan.–Apr. and Dec. (H.H.D., B.K., A.C.L. *et al.*). Male, Barrow Gurney resrs., Jan. 15 (A.C.L.), Apr. 1 (G.E.C.) ; pair, same place, Oct. 25 (C.A.L.W., F.W.). Male, Chew Magna res., Feb. 25 (P.J.C.). Two females, Cheddar res., Dec. 2 (B.K.).

GOLDENEYE *Bucephala clangula*

S. Up to 30, Blagdon res., various dates, Jan.–Mar., and up to 24, Cheddar res., same period (G.C.B., B.K. *et al.*). Of 19, Blagdon, Jan. 14, as many as 12 were ad. males (P.J.C., R.H.P.) ; 19, including nine ad. males, Cheddar, Dec. 26 (P.J.C.).

COMMON SCOTER *Melanitta nigra*

S. Two females, Blagdon res., Jan. 29 (W.L.R.) and a male, July 22 (P.J.C.). Two females, Cheddar res., Sept. 30 (P.J.C., B.K.).

GOOSANDER *Mergus merganser*

S. Two ad. males, Barrow Gurney resrs., Jan. 14, 15 (G.E.C., P.J.C., A.C.L.). Up to four at both Blagdon and Cheddar, various occasions, Jan.–Mar. (G.C.B., D.I.T.W. *et al.*). One, Cheddar res., Dec. 20 (R.H.P., W.L.R.), and two, 30th (P.J.C., B.K.).

SMEW *Mergus albellus*

S. Frequently seen (up to 16, including some ad. males), Blagdon res., early Jan.–early Mar. (G.C.B., B.K., R.A.S. *et al.*) ; three, same place, Dec. 26 (H.H.D.). Four, Cheddar res., Jan. 21 (B.K.). One, Barrow Gurney resrs., Feb. 25 (G.E.C., P.J.C.).

CORMORANT *Phalacrocorax carbo*

G. Twice seen inland, early Oct.—one in flight over the city (G.A.K.), and one on Avon, Hanham (R.E. Swanborough per E.W.P.).

S. Twenty-five occupied nests, north cliffs, Steep Holm, June 23 (R.H.P.). Frequent inland, Cheddar res., largest counts—eight, Apr. 29 (B.K.) and nine, Dec. 26 (P.J.C.).

FULMAR *Fulmarus glacialis*

S. At least three close off Rudder Rock, Steep Holm, Apr. 22, one of which alighted on cliff top (D.R.L.) ; one in flight close under north cliffs, same place, June 3 (B.K., W.L.R.), and one between the island and Weston-super-Mare, 23rd (R.H.P., M.T.).

SLAVONIAN GREBE *Podiceps auritus*

S. One, Blagdon res., Dec. 10 (B.K.)—the only record for the year.

BLACK-NECKED GREBE *Podiceps nigricollis*

S. Single bird, Blagdon res., various dates, mid-Jan. to mid-Apr. (G.C.B., B.K., A.C.L. *et al.*) ; one, same place, Sept. 20 (R.H.P.). Two, Barrow Gurney resrs., Sept. 17, 18, Oct. 14 (P.J.C., A.C.L., W.R.T.).

GREAT NORTHERN DIVER *Colymbus immer*

S. One, Cheddar res., mid-Nov., and two, late Nov. to end of year (P.J.C., H.H.D., B.K. *et al.*).

RED-THROATED DIVER *Colymbus stellatus*

S. One, Cheddar res., Mar. 4–11 or later (B.K., W.L.R.).

TURTLE-DOVE *Streptopelia turtur*

S. Three pairs breeding, Leigh Woods, May–June (R.V.C.).

BAR-TAILED GODWIT *Limosa lapponica*

G. Two on Estuary, New Grounds, May 11, and one, Aug. 7 (H.J.B.).

BLACK-TAILED GODWIT *Limosa limosa*

G. Up to five on Estuary, New Grounds, various dates, Apr.–May (H.J.B., D.F.McK.) ; four, same place, Aug. 16 (H.J.B.).

WOODCOCK *Scolopax rusticola*

G. Single birds, Wotton-under-Edge, Jan. 25, Oct. 18 (H.F.W.).

S. One, Lower Failand, Nov. 17 (R.A.S.).

JACK SNIPE *Lymnocryptes minimus*

S. Three at claypits, Cheddar res., Feb. 25, and two, Mar. 4 (B.K.).

GREY PHALAROPE *Phalaropus fulicarius*

G. One, Severn Beach, Sept. 16 (R.H.P.).

TURNSTONE *Arenaria interpres*

G. A few on Estuary, New Grounds, in Aug.; largest number —16 on 1st (H.J.B.). At least 200, Severn Beach, Sept. 30 (H.D.).

S. Party of five, Cheddar res., May 19 (B.K.).

KNOT *Calidris canutus*

G. About 100, Severn Beach, May 2 (R.H.P.), and seven on Estuary, New Grounds, 11th (H.J.B.).

RUFF *Philomachus pugnax*

S. Five, Barrow Gurney resrs., Sept. 11 (G.E.C.), and three, 17th (A.C.L.).

COMMON SANDPIPER *Actitis hypoleucos*

G. Wintering bird on Avon, Sea Mills, Dec. 28 (A.C.L.).

S. Several again wintering at reservoirs—single bird, Barrow Gurney, various dates, mid.-Jan. to mid.-Mar, and late Nov. to early Dec. (G.E.C., P.J.C. *et al.*); one, sometimes two, Cheddar, various occasions, Mar. and early Nov. to end of year (H.H.D., B.K. *et al.*). One on Avon, Pill, Nov. 18 (R.H.P.).

WOOD-SANDPIPER *Tringa glareola*

S. One, in company with a Green Sandpiper, Blagdon res., Sept. 9. The bird was viewed (with telescope) at 30 yards range by P.J.C., who has supplied full and conclusive details. Only one previous record from the reservoirs (cf. *Proc. B.N.S.*, 1939, p. 32).

GREEN SANDPIPER *Tringa ochropus*

G. One, New Grounds, Sept. 8 (L.W.H.).

S. Single birds, Yeo Estuary, Feb. 4, Aug. 5 (W.L.R.); three, same place, Aug. 19 (D.I.T.W.). Single birds, Blagdon res., various dates, Sept.–Nov. (G.C.B., B.K. *et al.*). One, Cheddar res., Oct. 7 (B.K.). Two, Litton res., Dec. 16 (R.V.C.).

SPOTTED REDSHANK *Tringa erythropus*

S. Two, in the dark breeding dress, Blagdon res., Apr. 8 (first spring record for the district). The birds were seen, both in flight and at the water's edge, by Mr. and Mrs. G. C. B., who have supplied accurate details of behaviour, plumage and soft parts. One autumn record—single bird, same reservoir, Sept. 30 (R.H.P.).

GREENSHANK *Tringa nebularia*

G. New Grounds: one, Aug. 1; two, 26th (H.J.B.) and Sept. 8 (L.W.H.).

S. Two, Weston Bay, Oct. 25 (W.L.R.), and two Blagdon res., 28th (B.K.)—latest autumn passage dates for County of Somerset.

GOLDEN PLOVER *Pluvialis apricaria*

S. About 150, Lansdown, Bath, Apr. 9; some apparently of northern form *P. a. altifrons* (F.L.B.). Lulsgate aerodrome: 45, Sept. 20 (R.H.P.); 70, Oct. 6 (G.G.C.); 100, Nov. 4 (H.H.D.). Eighty-five, Barrow Gurney, Oct. 28 (G.E.C.).

GREY PLOVER *Squatarola squatarola*

G. Three, in partial summer plumage, Severn Beach, May 5 (B.K.). One, New Grounds, May 22 (H.J.B.); three, two still in summer plumage, same place, Sept. 23 (P.J.C., B.K.).

S. One or more, St. George's Wharf, Apr. 24 (A.C.L.). Two, Yeo Estuary, Jan. 7, Sept. 30, Dec. 2 (W.L.R.).

LAPWING *Vanellus vanellus*

G. About 1,250, New Grounds, Feb. 17 (R.H.P.).

S. At least 1,200, Weston Air Port, Feb. 8 (W.L.R.). Five hundred and twenty-six counted, Blagdon res., Oct. 11 (B.K.).

OYSTER-CATCHER *Haematopus ostralegus*

G. Single birds, New Grounds, Aug. 20 (H.J.B.), and Hallen Marsh, Oct. 14 (C.A.L.W., F. W.).

S. One, Barrow Gurney resrs., Sept. 10 (P.J.C.). Ninety-one off Brean Down, Oct. 11 (W.L.R.).

BLACK TERN *Chlidonias niger*

S. Unaccountably scarce on spring passage—the only report being of a single bird, Blagdon res., May 12 (B.K.). Among September records from the reservoirs are those of one, Chew Magna, 15th (G.C.B.); four, Blagdon, 20th (R.H.P.); three, Barrow Gurney, 28th (P.J.C.); and up to five, Cheddar, various occasions, 16–30th (G.G.C., P.J.C., B.K.).

SANDWICH TERN *Sterna sandvicensis*

S. Three clearly identified, Cheddar res., Sept. 8 (P.J.C.).

COMMON TERN *Sterna hirundo*. ARCTIC TERN *Sterna macrura*

S. Not reported from reservoirs in spring, and only a few seen on return passage. Up to three, Commons or Arctics, Blagdon, several dates, late July to mid-Sept. (P.J.C.). Of 26 viewed at rest, Cheddar, Sept. 8, nine appeared to be Commons, while the remainder, with their noticeably shorter legs, were considered to be Arctics; one, Arctic, same place, 22nd (P.J.C.). Single Arctic, Sand Bay, Apr. 19; an Arctic (perhaps same bird) found dead, Woodspring Bay, 28th (W.L.R.).

LITTLE TERN *Sterna albifrons*

S. Reported from Cheddar res. on both passages—two, May 24 (B.K.); nine, Sept. 22 (P.J.C.), and four, 23rd (K.M.C., C.A.L.W., F.W.).

BLACK-HEADED GULL *Larus ridibundus*

S. A juvenile, with ring, recovered at mouth of the Avon, July 18, 1950, had been trapped and ringed, Colchester, Essex (154 miles E.), only ten days previously (*Brit. Birds*, XLIV, p. 304).

GREAT BLACK-BACKED GULL *Larus marinus*

S. Continues to increase as breeding species, Steep Holm ; 40 occupied nests, May 12 (R.H.P.). Eighteen (14 ads.) inland, Barrow Gurney resrs., Oct. 28 (P.J.C.).

ICELAND GULL *Larus glaucoides*

G. One, R. Avon (cf. below).

S. An immature, in first summer plumage, viewed at close range, both on water and in flight, R. Avon, nr. Bedminster Bridge, May 18, 19 (P.J.C., R.H.P.). In sending full confirmatory details, P.J.C. records that the bird was similar in size to accompanying Herring-Gulls, though slimmer in build ; that its wing-beats were quicker than those of Herring-Gull ; and that, when seen at rest, its primary tips extended considerably (at least 1½–2-in.) beyond the tail.

What may have been an Iceland Gull in more or less adult plumage (bird described as being a little larger than accompanying Common Gulls, and having very pale, grey mantle and no black on primaries) was seen by G.G.C. and C.A.L.W. in a field at Bleadon, Oct. 27, 28.

KITTIWAKE *Rissa tridactyla*

S. Four, or more, Steep Holm, Apr. 22 (D.R.L.). Single birds, both badly oiled, Cheddar res., Apr. 15, Nov. 25 (B.K.).

RAZORBILL *Alca torda*

S. One close inshore, Steep Holm, May 12 (H.H.D., R.H.P.).

PUFFIN *Fratercula arctica*

G. Dead bird, Severn Beach, Feb. 25 (M.T.).

S. One found dead, Cheddar res., Apr. 8 (B.K.).

CORN-CRAKE *Crex crex*

G. Heard, Severn House Farm, nr. Berkeley, Apr. 17 (H.D.).

S. Breeding reported from Charterhouse (Lord Winterstoke's keeper *per* H.D.). Frequently heard nr. Abbots Leigh in May (R.V.C.). One in corn crop, Little Stoke, early Sept. (H.H.D.). One shot, Blagdon res., Oct. 27 (K.B.S. Brown per N.W.M.).

LITTLE CRAKE *Porzana parva*

G. One, New Grounds decoy pool, Apr. 22–29. The bird, usually to be seen feeding at the water's edge, was finally found dead in one of the pipes, and is now in the skin collection, British

Museum (Nat. Hist.); first authentic record for the district (H.J.B., H.H.D., P.S. *et al.*).

WATER-RAIL *Rallus aquaticus*

G. One found dead, Slimbridge, Oct. 9 (H.F.W.).

S. Dead bird, Blagdon res., Apr. 15 (R.H.P.). One at claypits, Cheddar res., Feb. 25 (B.K.).

COOT *Fulica atra*

S. Record count of 2,100, Cheddar res., Dec. 17 (B.K.).

RED-LEGGED PARTRIDGE *Alectoris rufa*

S. Covey of five, Marksbury, Aug. 16 (B.K.).

QUAIL *Coturnix coturnix*

G. Bird calling from bean-field, Aust, Aug. 5 (R.A.S.).

LEPIDOPTERA NOTES, BRISTOL DISTRICT, 1951

By C. S. H. Blathwayt, M.A., F.R.E.S., Hon. Sec. of the Entomological Section

(*Received Jan. 1, 1952. Read in title at General Meeting, March 6, 1952*)

The first four months of the year were generally very wet and of little use from the Lepidopterist's point of view and, by May, the season was quite exceptionally backward. The months of June and July were, however, very fine and compensated for the poorness of the previous months. August was again wet and September was a disappointing month apart from a few warm nights. October was mainly dry, and collecting at Ivy more profitable than in recent years, but the year concluded with a wet November and December. Although 1951 was better than 1950 it was by no means a good year. The records given below are all from an area of radius of approximately 20 miles from the City and County of Bristol and are this year mostly my personal records, as other members of the Section did little collecting in the Bristol area. I am, however, grateful to Mr. C. L. Bell (C.L.B.) for some interesting records of Butterflies and Hawk-Moths which are included below.

Rhopalocera (Butterflies)

Euphydryas aurinia Rott. (Marsh Fritillary). Nests of larvae at Wickwar in early spring (C.L.B.).

Nymphalis io Linn. (Peacock). One specimen bred with bar on forewing broken up into three dots (C.L.B.).

Limenitis camilla Linn. (White Admiral). Larvae found on Honeysuckle at Wickwar in the spring (C.L.B.).

Aglais urticae (Small Tortoiseshell). Out of approximately 1,000 bred, several minor variations in ground colour but not in markings. Three bred, where colour, especially on the underside, is tinged with green. Bred under quite normal conditions, and British Museum has confirmed that the greenish hue is due to some pigmental derangement (C.L.B.).

Heterocera (Moths)

Mimas tiliae Linn. (Lime Hawk). Number of pupae dug in and around Bristol, and several interesting specimens emerged ; variation largely in the different shadings and markings of the insects, also a brick red (Female) var. (C.L.B.).

Deilephila porcellus Linn. (Small Elephant Hawk). Common at light at Weston. June and July.

D. elpenor Linn. (Large Elephant Hawk). Ditto but not as common.

Cerura hermelina Goeze (*bifida* Hubn.) (Poplar Kitten). Two at light at Weston late June and early July.

Stauropus fagi Linn. (Lobster Prominent). Several at light at Weston late June and early July.

Drymonia ruficornis Hufn. (*chaonia* Hubn.) (Lunar Marbled-brown). One at light at Weston on May 19 which laid several eggs from which pupae have been bred.

Pheosia tremula Clerck (Greater Swallow Prominent). Weston, June and Aug., }
P. gnoma Fabr. (*dictaeoides* Esp.) (Lesser Swallow Prominent). a few at light. }

Notodonta ziczac Linn. (Pebble Prominent). Several at light, }
N. dromedarius Linn. (Iron Prominent). Weston, May–Aug. }

Habrosyne derasa Linn. (Buff-arches). Abundant at light, Weston, July and early Aug.

Thyatira batis Linn. (Peach-blossom). A few only in June and July at light at Weston.

Tethea ocularis Linn. (*octogesima* Hubn.) (Figure of Eighty). A few at light at Weston in June and July.

Polyploca ridens Fabr. (Frosted Green Lutestring). Several at light at Weston in late April and early May.

Lymantria monacha Linn. (Black-arched Tussock). Aug. at light, Weston.

Poecilocampa populi Linn. (December Eggar). Nov. and Dec. at light Weston. Abundant on Dec. 15.

Drepana binaria Hufn. (Oak Hook-tip). June and Aug. at light, Weston.

Pseudoips bicolorana Fuessl. (*quercana* Schiff) (Scarce Silver-lines). Several at light in late July and Aug. at Weston.

Sarrothripus revayana Scot. (*undulana* Hubn.) (Large Marbled Tort). Sept. and Oct. at light, Weston.

Miltochrista miniata Forst. (Rosy Footman). At light, Weston ; common in July and one in Sept.

Eilema griseola Hubn. (*stramineola* Doubl.) (Dingy Footman). Both the type and var. *flava* fairly common at light at Shapwick in Aug.

E. complana Linn. (Scarce Footman). At light, Weston, in July.

E. sororcula Hufn. (Orange Footman). At light, Weston, in May and June.

Apatele alni Linn. (Alder Dagger). At light, Weston, 10 June.

Craniophora ligustri Fabr. (Crown). Several at light, Weston, late June and July,

Cryphia muralis Forst. (*impar* Hubn.) (Marbled Vert). Common at light, Weston. July and Aug.

Agrotis vestigialis Rott. (Archer Dart). Common in one locality on North Somerset Coast in Sept.

A. clavis Hufn. (*corticea* Hubn.) (Heart and Club). Common at light at Weston in June.

A. cinerea Hubn. (Light Feathered Rustic). At light, Weston, June.

Euxoa nigricans Linn. (Garden Dart). At light, Weston, in Aug.

E. tritici Linn. (White-line Dart). Common, Somerset Coast, in Aug.

Amathes sexstrigata Haw. (*umbrosa* Hubn.) (Six-striped Rustic). Common on ragwort, Somerset Coast, in Aug.

Lampra fimbriata Schreber (*fimbria* Linn.) (Broad-bordered Yellow-underwing). At light, Weston, in July and Aug.

Hadena w-latinum Borkh. (*genistae* Borkh.) (Light Brocade). Several at light, Weston, in June.

H. suasa Schiff. (*dissimilis* Knoch) (Dog's-tooth). A few on sugar, North Somerset.

Tholera cespitis Fabr. (Hedge Rustic). At light, Weston, in Sept.

Eumichtis lichenea Hubn. (Feathered Ranuncule). Common at light at Weston in Sept.

Aporophyla nigra Haw. (Black Rustic). Common at light, Weston, in late Sept. and early Oct.

Antitype flavicincta Fabr. (Large Ranuncule). Common at light at Weston in Sept.

Griposia aprilina Linn. (Common Merveille-du-jour). Several at light, Weston, in Oct.

Brachionycha sphinx Hufn. (Common Sprawler). At light, Weston, in Nov.

Celaena leucostigma Hubn. (Brown Crescent). Several, North Somerset Coast, in Aug.

Hydraecia paludis Tutt. (Saltern Ear). North Somerset Coast, Aug.

Nonagria sparganii Esp. (Webb's Wainscot). Several, North Somerset
N. typhae Thunb. (Bulrush Wainscot). Coast, Aug.

Rhizedra lutosa Hubn. (Large Wainscot). Several at light at Weston, late Sept.

Cosmia affinis Linn. (Lesser-spotted Pinion). At light at Weston in Sept.

Cerastis rubricosa Fabr. (Red Chestnut). A few at Sallow, North
Orthosia gracilis Fabr. (Powdered Quaker). Somerset in April.

Panolis flammea Schiff. (*piniperda* Panz.) (Pine Beau). At light, Weston, in April.

Atethmia xerampelina Hubn. (Centre-barred Sallow). Fairly common at light at Weston in Sept.

Tiliacea citrago Linn. (Orange Sallow). Several at light at Weston in Sept.

Lithophane semibrunnea Haw. (Tawny Pinion). At Ivy at Weston. Oct.

L. socia Rott. (Pale Pinion). Common at Ivy, Weston, in Oct. and early Nov.

Xylena vetusta Hubn. (Red Sword-grass). Early Nov., Weston, at Ivy.

Polychrisia moneta Fabr. (Silver Eight). At light, Weston, in July.

Plusia festucae Linn. (Gold Spot). Several, North Somerset, in Sept.

Laspeyria flexula Schiff. (Beautiful Hook-wing). Several, North Somerset, in July at light.

Hemistola immaculata Thunb. (*chrysoprasaria* Esp.) (Lesser Emerald). Common at light in July, Weston.

Acasis viretata Hubn. (Brindle-barred Yellow). Very common at light, Weston, in May and Aug.

Rhodometra sacraria Linn. (Vestal). One in North Somerset in Sept.

Discoloxia blomeri Curt. (Blomer's Rivulet). Several at light at Weston, June and July.

Coenotephria derivata Schiff. (*nigrofasciaria* Goeze) (Streamer). Fairly common at light in April and May at Weston.

Eupithecia linariata Fabr. (Toadflax Pug). Several at light at Weston in July and Sept.

E. indigata Hubn. (Ochreous Pug). Several at light at Weston in May and early June.

E. venosata Fabr. (Netted Pug). At light, Weston, in May.

E. dodoneata Guen. (Oak-tree Pug). At light, late April and early May, Weston —fairly common.

Ellopia fasciaria Linn. (*prosapiaria* Linn.) (Barred Red). At light at Weston in July.

Deuteronomos fuscantaria Haw. (Dusky Thorn). Very common at light at Weston in late Aug. and Sept.

D. erosaria Borkh. (September Thorn). A few at light at Weston in Aug. and Sept.

Selenia tetralunaria Hufn. (Purple Thorn). A few late April and early May at light at Weston.

Zeuzera pyrina Linn. (Wood Leopard). A pair at light at Weston in July.

Cossus cossus Linn. (*ligniperda* Fabr.) (Goat). Several at light at Weston in late June.

ON THE LENGTH OF LIFE OF ADULT DRAGONFLIES (ODONATA-ANISOPTERA) IN THE FIELD

By N. W. Moore, B.A.

(*Read in title at General Meeting, March 6, 1952. Received, March 11, 1952*)

Introduction

Most of the information about the longevity of insects has been obtained by keeping them in captivity. Adult dragonflies do not survive long in cages: they damage themselves attempting to fly out, and, unless the cage is very large, they cannot feed themselves, since only flying insects are taken. In captivity a newly-emerged *Libellula quadrimaculata* will live up to 6½ days without food. However, since the feeding movements of the mouth-parts occur as soon as food touches them, dragonflies can be fed by hand. Mittelstaedt (1950) kept *Anax imperator* under very unnatural conditions for 14 days by this means. But the study of captive animals cannot do more than suggest what occurs in the field: it cannot be assumed that the natural average age is more or less than the average age recorded in captivity.

Length of life in the field can only be ascertained by marking insects so that they can be recognised on subsequent occasions. Dispersal and population problems have been investigated by marking in several insect species (Williams, 1947). As far as the writer knows, only one such study has been recorded for the Odonata: Borror (1934) investigated the ecology of the Coenagrionid damselfly *Argia moesta*. He found that the length of life of this species was 3–4 weeks. In this paper are recorded the results of some marking experiments made on dragonflies common near Bristol. Indirect evidence about the normal longevity of dragonflies is discussed.

Methods

The data were obtained in the course of a study of the behaviour and ecology of dragonflies by the Portbury river in the "Gordano" valley between Portishead and Clevedon, Somerset, and by a pond in Stoke Bishop, Bristol. Methods of marking are described in detail elsewhere (Moore, 1952). In brief: identification marks were either painted on the wings of dragonflies which had been caught in a net, or were sprayed on to free insects. The spray paint was a cellulose one. Both oil and cellulose paints were used for direct marking. Prolonged search in the areas in which insects had been marked was made on subsequent visits. The presence or absence of the marked insects was recorded after each visit.

RESULTS

Table I summarises the results of the marking experiments. The time between marking and the last observation of each insect is recorded for 21 dragonflies. The longest time for each species is printed in italics, and the dates of marking and of last observed occurrences of these are given. All records are of males unless otherwise stated. All were marked as mature adults by water unless otherwise stated.

In addition, a male and a female *Aeshna cyanea* were marked, and seen again two days later. Two male *Anax imperator* were seen one and four days after marking. These clearly give no indication of the normal length of life of Aeshnid dragonflies. What was almost certainly the same specimen of *Aeshna grandis* was observed at Stoke Bishop from 1.8.51 to 2.9.51 (33 days).

TABLE I

MINIMAL AGES IN DAYS OF 21 LIBELLULID DRAGONFLIES MARKED IN THE FIELD

Species	Minimal ages in days	Longest minimal age	
		Date marked	Date last observed
Libellula quadrimaculata ...	1 ; 2 ; 2 ; *18*	24.6.49	12. 7.49
L. depressa	2 ; 3 ; 3†; 9 ; 11†; *15*†	27.6.49	12. 7.49
Orthetrum cancellatum ...	1*; 3 ; 4 ; 12 ; 13 ; *22*	20.6.49	12. 7.49
Sympetrum striolatum ...	4 ; 7 ; 9 ; 22 ; *29*	19.9.51	17.10.51

Table II gives the approximate length of season of seven common dragonflies near Clevedon in 1951. In 1949 the seasons were earlier.

Table III gives the times between the date of the last teneral insect observed and the last mature insect observed in 1951.

* Female

† Immature when marked away from water

INTERPRETATION OF RESULTS

In no case was the age of a dragonfly known on marking, nor, of course, was the time it survived after last being observed. The greatest lengths of life recorded must be shorter than the actual lengths of life by several days. The length of time of the immature stages of these dragonflies is not known. Two male *L. depressa* were marked while immature. They were observed again three days later—their abdomens were not yet blue. This shows that in this species the stage of immaturity lasts for at least three days. This stage may be considerably longer, for in the Zygopteran *Argia moesta* it lasts from 7–14 days (Borror, 1934).

TABLE II

LENGTHS OF SEASON, 1951

Species	First Seen	Last Seen	Approximate (Minimal) Length of season in days
Brachytron pratense... ...	24.5.51	3. 7.51	44
Orthetrum cancellatum ...	14.6.51	7. 8.51	54
Anax imperator	20.6.51	22. 8.51	63
Libellula quadrimaculata ...	30.5.51	7. 8.51	70
L. depressa	24.5.51	7. 8.51	76
Aeshna cyanea	16.7.51	24.10.51	100
Sympetrum striolatum ...	3.7.51	1.11.51	121

TABLE III

INDICATION OF AGES OF DRAGONFLIES OBTAINED BY SUBTRACTING DATE OF LAST TENERAL OBSERVED FROM DATE OF LAST ADULT OBSERVED

Species	Date last teneral seen	Date last adult seen	Days
Libellula quadrimaculata ...	20. 6.51	7.8.51	48
L. depressa	3. 7.51	7.8.51	35
Orthetrum cancellatum ...	20. 6.51	7.8.51	48
Sympetrum striolatum ...	21.10.51	1.11.51	11

The length of life of an individual insect must lie within the length of season of its species. The lengths of season given in Table II indicate the maximum length of life theoretically possible for individuals of each species. They vary from about 6 to about 17 weeks.

Some indication of the length of life of adult dragonflies can be derived by subtracting the date of the last teneral observed from the date on which the last adult was seen. Since the river was not visited early in the morning, when most dragonflies emerge, it is almost certain that some dragonflies emerged after the dates on which last emergences were recorded. These figures suggest that these dragonflies do not normally live longer than 7 weeks—probably considerably less. The case of *S. striolatum* is not strictly comparable with those of the other three species, because the end of its season coincides with the unfavourable physical conditions of late autumn.

It is concluded from the direct and indirect evidence given above that adult dragonflies of the species investigated probably live from 3–5 weeks in the field. The proportion of the adult population which survives this length of time is not known. There are reasons for thinking it may be rather high (see the following discussion).

CAUSES OF DEATH

1. Predators

There are few records of emerging dragonflies being eaten by predators—perhaps because most species emerge at dawn. But the records (e.g. Corbet, 1951) suggest that large numbers of emerging dragonflies are eaten by birds on occasions. Also, there are not many British records of mature dragonflies being eaten: the Hobby (*Falco subbuteo*) is probably the only bird species which habitually feeds on dragonflies. It is not common in Britain. (The work of Kennedy (1950) on the stomach contents of North American birds suggests that they, at all events, do not normally feed extensively on adult dragonflies.)

There are a number of records of dragonflies eating other dragonflies. These refer to exceptional events (the writer has only observed one such instance). The normal prey of dragonflies are much smaller insects—mainly Diptera.

Dragonflies spend the night and much of the morning and evening perched in trees, etc. They may be preyed upon at these times by nocturnal animals and by animals which are active earlier and later in the day than the dragonflies themselves. This would not be easily observed.

Evidence that predators are important causes of death in mature dragonflies is lacking so far. At emergence the effect of predators may be important. Nothing is known of the importance of parasites and disease as causes of death of adult dragonflies.

The importance of the effects of predators has a bearing on the validity of estimates of longevity made from marking experiments. Marked insects are more conspicuous than unmarked ones. If dragonflies have *any* predators the marked ones must on the average live less long than unmarked ones. The more the animal is preyed upon, the greater must be the difference between the longevity of marked and unmarked specimens.

2. *Physical causes*

Observations suggest that gales, heavy rain and frosts do not themselves kill dragonflies. Bad weather may have important indirect effects (see below).

3. *Starvation*

The potential prey of dragonflies appears normally to be superabundant. Nevertheless, it is suggested that most of those dragonflies which have survived the attacks of predators in the immature stages die of starvation, brought about by other factors than shortage of food. These factors are :—

(1) Prolonged bad weather and, in autumn, shortness of day.

(2) Damage to wings and legs resulting from clashes with other dragonflies.

Both prevent the insects from feeding. The temperature below which a dragonfly does not fly is not accurately known. It appears to be rather high. There is no doubt that bad weather prevents flying and thus feeding. A dragonfly cannot live more than a few days without food (see above). It is therefore presumed that prolonged bad weather must cause the starvation of dragonflies.

The reproductive behaviour of male dragonflies results in violent clashes between males of the same, and sometimes of different, species (Moore, 1952). Male dragonflies are frequently caught with legs partly or wholly missing and with pieces of wings missing. It is almost certain that these injuries are due to the clashes. Damage to wings and legs clearly impairs the efficiency of the feeding mechanism. It must eventually cause starvation.

Kennedy (1950) suggests that dragonflies " die of old age ". Degeneration of tissues would hasten death by starvation. The two causes are closely interconnected.

It is here suggested that either most dragonfly adults live 3–5 weeks, or that many are killed by predators at emergence but most of the survivors live 3–5 weeks. Most of these, as in the other case, die eventually of starvation.

Longevity of the Odonata and other Insects

Lucas (1900) gives no evidence for his statement that dragonflies live for three months " sometimes less, sometimes more ". It is most unlikely that this estimate is true for any species of the Odonata found in Britain. Kennedy's (1950) estimate of 2–4 weeks is probably much nearer the truth. Borror's (1934) figures of 3–4 weeks for the Zygopteran *Argia moesta* have been referred to above. (The longest minimal age recorded for *Argia* was 24 days.) The present work shows that the small Anisopteran *Sympetrum striolatum* can live for over 4 weeks. This may not be exceptional in the Anisoptera. Species like *Sympycna fusca*, which hibernate, must live for several months as adults. Since the length of life appears to depend at least partly on weather it must vary from year to year. The distributional ranges of many species are very extensive: there may be considerable variation in average longevity within the range of each species. Therefore longevity must vary within and between species of dragonfly.

The few facts known about the longevity of adult insects as a whole show that there is great variation. The range is from a few hours in some mayflies to several years in some beetles and in the reproductive females of some social insects. But it is probable that the length of life of adult dragonflies is not very different from that of the majority of insect species.

SUMMARY

1. Adult insects of *Libellula quadrimaculata*, *L. depressa*, *Orthetrum cancellatum* and *Sympetrum striolatum* were marked, and observed as long as 18, 15, 22, 29 days later respectively.

2. From this and considerations of length of season, etc., it is concluded that the normal length of life of the adult Anisoptera investigated is about 3–5 weeks.

3. The relative importance of different causes of death in the Anisoptera is discussed.

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NOTE ON A SECTION OF ALLUVIUM AT BROADMEAD, BRISTOL

By T. R. Fry

(*Received, March 3, 1952. Read in title at General Meeting, March 6, 1952*)

During the summer of 1951, the writer paid a number of visits to the sites of several buildings which were being erected at Broadmead. Particular attention was paid to one of the deep column-holes in the central part of the site of Marks & Spencer's new building, and the following section was obtained :—

	ft.	ins.
Soil and made-ground	3	6
3. *Marsh clay :* Mottled clay with land-shells of recent species and impressions of rootlets	4	0
2. *Estuarine clay* : Fine clay, upper 13 ft. greenish, passing into light-brown	19	6
1. *River gravel :* Mainly composed of Pennant sandstone of a greenish tint, with ironstone (limonite) and a few pebbles of Lias limestone and other Mesozoic materials	4	0
Keuper Marl Red, sandy clay, mainly soft but becoming firmer towards the base	3	9
Total thickness ...	34	9

It is perhaps of some interest to compare the above section with one exposed in a deep well-sinking at Messrs. J. S. Fry & Sons' former factory at Union Street, which was recorded in 1906.[1] A bed of gravel 3 ft. in thickness, similar to Bed 1, was encountered at a depth of 34 ft., and this rested on a reddish sandstone which was presumably Keuper. Thus a total thickness of 26 ft. of alluvial beds was found to be present below made-ground and above the Keuper. At the time, these beds were erroneously also referred to the Keuper Series. This considerable thickness and extent of alluvium in the Broadmead area were probably due to the silting up of the lower valley of the River Frome following the depression of the land in Neolithic times. This subsidence affected the Bristol Channel region generally, including the lower valleys of the rivers.

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[1] Records of Well Sections at Bristol. *Proc. Bristol Nat. Soc.* (4th Ser.) Vol. I, pt. 3, p. 209.

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Professor O. V. DARBISHIRE	34
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VOLUME XXVIII, PART IV PRICE FIVE SHILLINGS

1952

PROCEEDINGS

OF THE

Bristol Naturalists' Society

EDITED BY H. W. TURNER AND SCOTT SIMPSON,
ASSISTED BY A COMMITTEE

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BRISTOL NATURALISTS SOCIETY

"Rerum cognocere causas."—Virgil

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AT THE BURLEIGH PRESS, BRISTOL

Issued July 16th, 1953

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25 1954

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REPORT OF COUNCIL

1952

THE numbers of the Society have remained fairly constant, total membership having risen from 408 to 413 during the year.

The Society has enjoyed a series of well-attended and varied general and sectional meetings, including several talks of great regional interest by local lecturers. " The natural history of autumn " was the theme of the special section of the Annual Exhibition held in the Botany Department of the University on two consecutive evenings in September. As in previous years, the exhibition was also greatly appreciated by parties of school children who were present by invitation on one afternoon.

The revised Rules were approved and confirmed respectively at two consecutive General Meetings during October.

The Society, together with the Bristol Folk House, the Somerset Archæological and Natural History Society and the Mid-Somerset Naturalists' Society, has been negotiating throughout the year for the lease of the island of Steepholm in the Bristol Channel.

The deaths of Mr. G. E. J. McMurtrie (past-president) and Miss E. B. Crellin were recorded with regret during the year.

E. J. VINNICOMBE, *Hon. Secretary.*

The Hon. Treasurer in Account with the Bristol Naturalists' Society

RECEIPTS AND PAYMENTS FOR THE YEAR ENDING 31 DECEMBER, 1952

Dr.

1951 £ s. d.			£ s. d.	£ s. d.	£ s. d.
	To Members' Subscriptions :—				
	Full Members	1951 ..	9 0 0		
		1952 ..	232 2 6		
		1953 ..	18 0 0		
244 2 6				259 2 6	
	,, ,, of the same household	1951 ..	1 0 0		
		1952 ..	22 10 0		
		1953 ..	2 0 0		
22 10 0				25 10 0	
	Country Members	1951 ..	10 0		
		1952 ..	25 11 0		
		1953 ..	1 10 0		
23 11 0				27 11 0	
	" Old " Associates	1952 ..	4 18 0		
		1953 ..	7 6		
7 19 6				5 5 6	
	" New " Associates	1951 ..	5 0		
		1952 ..	7 7 6		
6 2 6				7 12 6	
7 0 0	Affiliated Societies	1952		8 0 0	
311 5 6					333 1 6
	,, Separates and Covers :—				
	Proceedings, 1950, arrears ..				6 5 1
3 5 9 ,,	*Proceedings*, 1951				9 6
7 4 6 ,,	Sale of Publications				2 16 6
— — — ,,	Sale of Bird List				18 1
3 11 2 ,,	Profit on Dinner				— — —
	,, Interest on Deposit in Post Office				
7 2 5	Savings Bank				5 4 8
332 9 4					348 15 4
269 13 3 ,,	Balances from last Account ..				296 7 9
602 2 7					£645 3 1

Cr.

1951 £ s. d.		£ s. d.	£ s. d.
	By Subscriptions :—		
1 1 0	Ray Society	1 1 0	
3 5 0	Zoological Society (London)	7 15 0	
2 0 0	S.W. Naturalists' Union	2 0 0	
			10 16 0
139 0 4 ,,	*Proceedings* (1951)		113 10 6
32 11 3 ,,	Stationery and Printing		47 18 9
,,	Postages, etc. :—		
	Hon. Secretaries	32 19 7	
	Hon. Treasurer	3 8 6	
	Hon. Editor	10 0	
33 7 7	Hon. Librarian	1 1 9	37 19 10
1 10 0 ,,	Fire Insurance (Library)		6 0 0
7 5 6 ,,	Books and Periodicals		16 0 2
1 0 ,,	Rent (use of Library Room)		1 0
6 6 ,,	Bank Charges		10 6
14 14 5 ,,	Fares and Expenses of Meetings		20 5 1
6 0 0 ,,	Clerical Assistance (issue of Circulars, etc.) ..		6 10 0
4 14 2 ,,	Field Committee : Expenses		12 11
20 15 0 ,,	Bookbinding		— — —
6 2 7 ,,	Expenses of Festival Exhibition ..		— — —
,,	Grants to Sections :—		
— — —	Botanical	— —	
3 0 6	Entomological	2 17 6	
15 0 0	Geological	15 0 0	
15 0 0	Ornithological	15 0 0	32 17 6
305 14 10			293 2 3
,,	Balances to next Account :—		
102 4 4	Cash at Bank	89 1 1	
185 3 2	Deposit in Post Office Savings Bank ..	258 0 3	
9 0 3	Cash in hands of Hon. Secretaries ..	4 19 7	352 0 10
602 2 7			£645 3 1

A. H. PEACH, *Hon. Treasurer*,
3 January, 1953

Audited and found correct
Bristol, 13 January, 1953 F. W. EVENS, *Hon. Auditor*

REPORT OF BOTANICAL SECTION

1952

THE Section has met in each month throughout the year. In January Dr. R. Melville came from Kew to lecture on " The pollination of plants." Mr. T. H. Payne spoke at the February meeting on " The story of the woad," and in March another member of the Section, Mr. I. W. Evans, gave a description of the plants noted and excursions made during a visit to the Barrow-in-Furness District with the Botanical Society of the British Isles.

The late spring and the summer meetings were devoted as usual to the examination and naming of specimens. A number of excursions and field-walks were made to places of botanical interest in the neighbourhood. The following list includes the names of the leaders :—

April.	Yatton to Wrington : Miss D. Shaw.
May.	Staple Hill to Frenchay : Mr. I. W. Evans and Mr. M. Sutton. Clifton Down : Mrs. G. S. Wakefield.
June.	Left Bank of the Avon below the Suspension Bridge : Dr. A. F. Devonshire.
July.	Dursley and Stinchcombe Hill : Mr. H. F. Webb and Mr. E. E. Dunn.
Aug.	Burrington Coombe and Blackdown : Mr. P. F. Bird. Long Ashton to Cambridge Batch : Mr. F. W. Evens.
Sept.	Bitton to Wick : Mr. M. Sutton.
Nov.	Leigh Woods : Mr. F. W. Evens.

At the October meeting short papers were given by members as follows:—

A visit to the Channel Islands : Dr. C. L. Corbett.
A visit to S.W. Cornwall : Mrs. G. S. Wakefield.
Plants around Whitby : Dr. A. F. Devonshire.
Plants of the English Lake District : Mr. C. H. Cummins.
An account of the pollination of the *Utricularia* : Mr. E. D. Evens.

In November Mr. D. L. Abbott, from the University Research Station, Long Ashton, spoke on " Some aspects of ecology," and at the December meeting Mrs. M. L. Davis showed colour-transparencies of Swiss alpine plants.

At the Exhibition Meeting the Botanical Section was well represented by the following exhibits :—

Some uncommon autumn fruits : Mrs. E. M. Bell and Rev. A. F. Bell.
Autumn flowers from the Avon Gorge : Mr. and Mrs. C. H. Cummins.
Hedgerow fruits : Mr. E. H. Day.
Herbarium specimens of late summer and autumn flowering plants : Mr. I. W. Evans.
Microscope-slides showing the circulation of protoplasm in the *Elodea* : Mr. E. D. Evens.
Seeds and seedlings (including microscope-slides) : Mr. F. W. Evens.
Abscission layer in leaf form (microscope-slides) : Mrs. A. C. K. Fear.
Mosses, Liverworts, Lichens, etc., from Dartmoor, and specimens of Oak leaves from Wistman's Wood, Dartmoor : Mrs. J. Milton.
Autumn flowers and fruits from the garden : Mr. R. L. Stubbs and Mrs. A. C. Clinch.
Specimens of the Thistle Family : Mrs. G. S. Wakefield.
Weeds of the stubble : Mrs. M. L. Davis.

Throughout the summer several members collected specimens of *Polygonum* (*aviculare* section). These were later sent to Mr. D. W. Jowett, of Manchester, who identified all the local specimens as belonging to either *Polygonum aviculare* L. or *Polygonum aequale* Lindm., with one exception—*Polygonum aviculare* L. var. *angustissimum* Meisn.

M. L. DAVIS, *Hon. Secretary*

REPORT OF ENTOMOLOGICAL SECTION

1952

AT the 88th Annual General Meeting of the Section, held on January 7, Mr. A. H. Peach and Mr. C. S. H. Blathwayt were re-elected President and Hon. Secretary respectively. Mr. Peach gave a talk on " The life history of the Harvest Bug (*Trombicula autumnalis*) ".

Apart from the Annual Meeting there were five indoor meetings during the year, at four of which talks were given :—

Feb. 4. Mr. J. B. Gilpin-Brown : Grasshoppers, their songs and habits.
Mar. 3. Mr. J. Cowley : Dragonflies.
Oct. 6. Mr. C. L. Bell : Migrant Hawk Moths.
Nov. 3. Annual Exhibition.
Dec. 1. Mr. N. W. Moore : Dragonfly behaviour and ecology.

On July 5 the Section held a Field Meeting in conjunction with the Entomological Section of the Somerset Archaeological and Natural History Society at Goblin Combe, near Cleeve, Somerset, the leader being Mr. J. Cowley.

On September 20 Mr. C. L. Bell led an entomological party to the Society's General Field Meeting at Bratton in Wiltshire.

C. S. H. BLATHWAYT, *Hon. Secretary*

REPORT OF GEOLOGICAL SECTION

1952

AT the Annual Business Meeting, which was held on January 24, the following Officers were elected: Dr. F. Coles Phillips, President; Dr. Stanley Smith, Vice-President; Dr. I. S. Loupekine, Hon. Secretary; and Dr. D. T. Donovan, Recorder. Sir Lewis Fermor, Mr. H. Homeshaw, Dr. A. Marsden, Mrs. M. Marsden, Mrs. M. M. Perkins, Mr. H. S. Shinner, Dr. Scott Simpson, Mr. H. W. Turner, Dr. F. S. Wallis and Professor W. F. Whittard were appointed Committee Members. The formal business was followed by an exhibition of sound-films on the subject of " Minerals and rocks of industry ", in which the following films were shown: "Aluminium—mine to metal ", " This is salt ", " Rock of industry " and " Moving earth ".

On February 19 Professor J. H. Taylor (King's College, London) gave an illustrated account of "A geological visit to eastern Canada " in which he described his experiences in Nova Scotia and Newfoundland in 1950 and referred to several unsolved, major, geological problems connected with the region.

On March 20 Professor J. E. Harris gave an entertaining lecture on " Biological crystallography " in which he demonstrated by means of ingenious models and a polarising microscope adapted for projection the theory of polarised light and the uses of the method in the examination of biological materials.

Six field-meetings were held during the summer. On April 26 the Section visited by coach the Ozleworth Valley, where Dr. D. T. Donovan demonstrated the M. & U. Lias succession on the site of the proposed pumping station of the West Gloucestershire Water Co.; Mr. W. G. Close explained the engineering aspects of the scheme. On May 17 a day was spent in the Cardiff area, where a traverse of the southern margin of the S. Wales Coalfield was made under the leadership of Professor J. G. C. Anderson. On June 26 Dr. Stanley Smith led an evening excursion to Abbots Leigh, where a study was made of geological structures as revealed by surface features. On July 26, under the guidance of Mr. H. W. Turner, the Section visited the Portishead promontory where the excavations in progress for the extension of the Power Station afforded new exposures in the Trias, and evidence of reversed dips in the passage-beds between O.R.S. and L. Carboniferous. On August 19 Mr. M. L. K. Curtis led an evening meeting in the Whitchurch area where temporary exposures in the L. Lias were examined. Finally, on September 13, a joint meeting with the University of Bristol Tutorial Class in Geology took place, when Dr. F. S. Wallis guided a coach party in an examination of the Carboniferous Limestone and overlying Trias beds with remains of land reptiles in the Emborough area and of the site of the reservoir dam of the Bristol Waterworks Co. at Chew Stoke.

On October 21 Dr. A. T. J. Dollar (Birkbeck College, London) delivered a well-illustrated lecture entitled " Lundy: its early and later history " in which he described the geology and gave the preliminary results of his recent study of erosion levels on the island.

On November 20 Dr. I. S. Loupekine gave an illustrated account of "An excursion to the Sahara ", which took place in September, 1952, in connection with the Nineteenth International Geological Congress.

It is with deep regret that the Section records the death of Mr. G. E. J. McMurtrie.

I. S. LOUPEKINE, *Hon. Secretary*

REPORT OF ORNITHOLOGICAL SECTION

1952

'THE WREN THE WREN
THE KING OF ALL BIRDS..'

THE 29th Annual General Meeting was held on January 23, when Mr. A. C. Leach was re-elected President and Mr. H. H. Davis was again appointed Hon. Secretary. Mr. R. V. Culverwell, Mr. H. Dunnicliff and Miss C. A. L. Wareham were elected members of the General Committee to succeed Miss M. H. Rogers and Mr. J. H. Savory, due to retire by seniority, and Mr. R. H. Poulding, who resigned owing to pressure of other work. At a subsequent Committee meeting the following members were co-opted—Mr. P. J. Chadwick and Miss G. G. Clement.

Other winter meetings of the Section, devoted chiefly to lantern-lectures and films, were :

Feb. 13.	Mr. E. H. N. Lowther : A bird photographer in India.
Mar. 14.	Joint Meeting with the Royal Society for the Protection of Birds. Mr. J. H. R. Boswall : The Minsmere Nature Reserve and Avocets on Havergate Island.
Mar. 28.	Summer Field-programme Meeting.
Oct. 10.	Dr. W. J. L. Sladen : Birds of the Falkland Islands.
Nov. 14.	Exhibits and communications by Members.
Dec. 10.	Miss P. Barclay-Smith : Wildfowl and the need for their international conservation.

The third annual Field-work Report (1951), compiled by members of the General Committee, was issued in March, and arrangements were made for a similar Report for 1952, the following birds being scheduled for special study: Curlew, Barn Owl, Dipper, Wheatear, Pied Flycatcher and Red-backed Shrike. Plans were also made for the completion of B.T.O. nest-record cards, ringing on Steep Holm and elsewhere, and a continuation of duck counts at the reservoirs and Heron counts at the North Somerset heronries.

Twenty-six members took part in a most successful all-day excursion to Shapwick Heath on May 18. Nests with eggs of Teal and Goldfinch were located, and summer-visitors seen or heard included Whinchat, Redstart, Grasshopper Warbler, Wood Warbler and Red-backed Shrike. The usual Willow Tits could not be found, but Marsh Tits, previously considered absent from the locality, were noted and proved to be breeding.

A late-evening field-walk through the Forestry Commission clearings, Leigh Woods, on May 21, was led by Messrs. R. V. Culverwell and A. C. Leach. This excursion, planned to give opportunities of hearing Nightjar, Nightingale and Grasshopper Warbler, was attended by more than seventy members. A second evening walk over Backwell Hill, arranged for June 13, was cancelled on account of torrential rain.

In collaboration with the British Trust for Ornithology, a few members participated in a 1952 Breeding Season Distribution Survey of thirty scheduled species.

An early morning watch for diurnal migrants arranged on behalf of the British Empire Naturalists' Association for October 19, although attempted, was abandoned owing to strong winds and poor visibility. In a similar watch on the 26th, thirteen members took part and were stationed on the coast at

Hallen, Uphill and Brean Down, and inland at Bleadon Hill and Crook Peak. Migrating birds were counted in very large numbers—especially in coastal areas, while observers at Brean witnessed the initial stages of an unparalleled 'wreck' of storm-driven Leach's Petrels. Observations, showing an almost continuous passage (south and west) of Starlings, Chaffinches and other species, will be incorporated in the B.E.N.A. 1952 *Report on the Autumnal Movements of Certain Small Passerines.*

H. H. DAVIS, *Hon. Secretary*

ACCOUNT OF THE GENERAL MEETINGS

1952

THE 89th Annual General Meeting was held on Thursday, Jan. 17, the Exhibition Meeting on Sept. 24 and 25, and a meeting at which the revised Rules were approved on Oct. 2. The Rules were unanimously confirmed at the subsequent General Meeting on Oct. 9. General Meetings on 14 Feb., 6 March, 3 April, 9 Oct., 6 Nov. and 4 Dec. were addressed by visiting lecturers. Attendances ranged from 25 to 137 with an average of 61. There were also General Field-meetings during the Summer (see report appended).

At the Annual General Meeting the election of new Officers and Council was completed and Professor W. F. Whittard was unanimously elected President. The retiring President, Mr. H. H. Davis, delivered the Presidential Address on " Waders and wildfowl in the Severn Estuary ". He spoke of the large numbers of waders occurring during the spring and autumn passages, the large flocks of geese and wild duck wintering at the New Grounds, and the collection of captive birds maintained by the Severn Wildfowl Trust. The lecture concluded with an outline of the history of decoying in Britain, with special reference to the Berkeley Castle decoys at Purton and Slimbridge. The talk was illustrated by lantern-slides.

At the February meeting, when members of the Somerset Cave-diving Group were present by invitation, Mr. J. G. Cattley, M.Sc., of the Ministry of Agriculture and Fisheries Laboratories at Lowestoft, outlined the history of underwater photography and described its applications and the special problems which had to be solved. His lecture was followed by two films of great technical interest on the subject.

In March, Dr. Grey Walter, M.A., D.Sc., Director of the Burden Neurological Institute, gave an address illustrated by lantern-slides and working models on " The imitation of life ". His audience was enthralled by his clear exposition of a difficult subject and by the entertaining demonstration which followed.

Mr. Richard St. Barbe Baker, Forestry Adviser and Sylviculturist, founder of " The men of the trees ", was the speaker at the April meeting. He gave a lecture on " Trees ", emphasising the importance of a naturalistic rather than a commercial approach to forestry. In October, Mr. Philip Rahtz described his excavations and discoveries at the local site of " The Roman settlement at Pagans' Hill ", and, in November, Dr. H. E. Hinton, B.Sc., Ph.D., Reader in Entomology in the University of Bristol, gave a lecture on " Some insects which have established intimate relations with ants ". These three lectures were all illustrated by very fine lantern-slides.

At the last General Meeting of the year, the visiting lecturer, Mr. John Gilmour, M.A., F.L.S., Director of the Botanical Garden at Cambridge, gave a most comprehensive and scholarly account of " Plant names ", in which he surveyed the history and meaning of Latin names, their pronunciation and writing, name changes, the fancy or vernacular names of garden plants and English names of wild flowers.

The Exhibition held in the Botany Department of the University on Wednesday and Thursday, 24 and 25 September, was arranged in two parts, and two films were shown during the course of each evening. One part of the Exhibition was entitled " The natural history of autumn ", and although this gave no scope to geologists, other sections were well represented. The Ornithological Section illustrated " Autumn migration " with large and small maps, diagrams and photographs. The Entomological Section showed specimens of Butterflies and Moths still flying in autumn, and the plants still available for food. The Botanical Section displayed many different aspects of autumn, including hedgerow and garden fruits, berries and flowers ; weeds of the stubble, shown growing on a bed of real stubble; 100 different kinds of wild flowers from the north bank of the Avon and a collection of plants from Dartmoor. Two microscopes were set up, one showing seeds, the other the cork-cell layer produced before leaf-fall. The other part of the exhibition was general, and contained many herbarium specimens of rare plants ; a collection of local fossils; a collection of fossils of the Wenlock Limestone ; an assortment of minerals, shells and fossils shown by a younger member of the society who had given much time to the preparation of his exhibit and displayed it extremely well ; and a selection of books recently acquired by the Library. On both evenings at 7.30 p.m. two enjoyable colour-films were shown by an amateur photographer of Bristol, Mr. B. G. Webber, One showed studies of gardens in and around Bristol, the other took viewers down the north coast of Cornwall, round Land's End and along the south coast, showing cliffs, coastline, sea and towns.

FIELD MEETINGS

Date	*District*	*Leaders*
19 April	Newent	Mrs. M. L. Davis, Mr. Ivor Evans
24 May	Marlborough and district	Mr. J. H. Halliday
21 June	Charterhouse and Cheddar	Mr. and Mrs. C. H. Cummins, Dr. Devonshire
19 July	Oldbury-on-Severn	Mrs. Wakefield, Miss Habgood
16 Aug.	Bradford-on-Avon	Mr. I. Evans, Mr. M. Sutton, Mr. Collet
20 Sept.	Bratton	Mr. C. Bell, Mr. I. Evans

The General Field Meetings in 1952 were, on the whole, well attended ; good weather on most occasions added considerably to the pleasures of field-work.

The visit to Newent in April was made primarily to collect wild daffodils, while, in May, a special study of the Chalk flora was made at Cherhill, a small village on the slope of the Chalk escarpment, leading up to the Marlborough Downs from the Oolites of the Calne district. Later in the day, the haunt of the Redstart near Savernake Forest was visited, and afterwards, during a walk over Bedwyn Common, members heard Chiffchaff, Garden Warbler, Willow Warbler, Blackcap and Wood Warbler, all in and around one copse. The Moonwort fern, *Botrychium lunaria*, was seen and so were several Woodlarks and Tree Pipits. Finally, after tea, a most attractive riverside walk provided a marshy and river-meadow environment for exploration.

Geranium sheum and a white form of Bugle were found at Charterhouse in June. While walking in the direction of Black Rock Gate, the fern, *Thelypteris robertiana*, was seen growing on the limestone scree and also a white form of Herb Robert. As the party climbed to the cliffs on the north-east side of Cheddar Gorge, *Orchis fuschii* was growing in abundance. On the top, members found the Cheddar Pink, *Thalictrum mimis*, *Sedum rupestre* and a flourishing colony of *Prunella laciniata*—a cream-flowered Selfheal; This last plant, a continental species, was first recorded as an addition to the British Flora by J. W. White in 1906.

In July at Oldbury-on-Severn a study of marsh plants was made. *Cochlearia anglicum*, *Somolus valerandi*, *Spartina stricta*, *Spergularia rubra* and *Aster trifolium* were some of the plants noted.

The season ended with a joint meeting at Bradford-on-Avon with the Bath Natural History Society in August, when aquatic plants in and at the side of the canal were the main interest, and an expedition to the Bratton district and White Horse Hill in September.

E. J. VINNICOMBE, *Hon. Secretary*
I. M. JAGO, *Hon. Secretary, Field Committee*

OBITUARY

G. E. J. McMurtrie

GEORGE E. J. McMURTRIE, born at Radstock on 3rd November, 1864, was the son of James McMurtrie. His father was a frequent contributor to the *Proceedings of the Somerset Archaeological and Natural History Society* on both archaeological and geological subjects.

George McMurtrie was educated at King's School, Bruton, and the early home influence of his father soon showed its effect on his life and thought for he was always interested in the many aspects of the English countryside.

After leaving school he attended mining lectures at University College, Bristol, and then served his apprenticeship to the mining industry. His first appointment was at the Poynton Colliery, Cheshire, and thence to the Forest of Dean. The approaching retirement of his father brought him to Radstock in the early days of the present century and he eventually became general manager of the Waldegrave Collieries until his retirement to Westbury-on-Trym in 1926. Then for many years he acted as a mining consultant and was in much demand during the second World War in connection with claims regarding the approaching nationalization of the mines.

McMurtrie was a keen and devoted member of the Bristol Naturalists' Society and its Geological Section. He served on Council, and was elected President in January, 1935. His business instincts soon led him to appoint a Reorganisation Committee and he induced Council to accept a programme of greater publicity for the activities of the Society and the wide circulation of a leaflet describing the advantages and types of membership. The same Committee completely revised the then out-of-date rules and reorganised the finances so that subscriptions, both for parent Society and the Sections, were paid to the Treasurer. He was a great advocate for an all-in subscription covering the Society and all Sections but this reform did not come until after his term of Presidency, which covered the years 1935–1937.

His only publications were his Presidential Addresses in the Society's *Proceedings*. The first dealt with the former and present methods of cutting, loading and conveying coal, whilst in the second he described the treatment of coal after it has reached the surface, and the past and present methods of lighting the underground roads. In the third address he reviewed the activities of the Society from 1933 to 1937.

His keenness on matters archaeological was reflected in his insistence that at least one winter lecture to the parent Society should be on archaeological matters. This action, incorporated in the minutes of the Society, was a compromise between his desire for an Archaeological Section and the feeling of others that there was not sufficient promise of support for such a venture.

Throughout his life he was keen and enthusiastic about any activity in which he was engaged, whether it was cultural, practical or political. Naturally, his geology was chiefly concerned with the Coal Measures though here he was rather conservative and suspicious of new theories. He was an enthusiastic gardener and even in his later years it was a delightful tonic and stimulus to listen to his rather quick but forceful speech and argument.

He was very appreciative of his election to honorary membership of the Society. He left Bristol for Stratford-sub-Castle in 1951 and died on 13 December, 1952, at the advanced age of 88 years—just a week after the celebration of his diamond wedding.

The sympathy of all members of the Society is extended to his family.

F. S. W.

THE ENIGMA OF THE EARLIEST FOSSILS

By W. F. Whittard, Ph.D., D.Sc.

(*Being the Presidential Address delivered Jan. 15, 1953. Received for publication, Feb. 12, 1953.*)

ABSTRACT

The occurrences of Pre-Cambrian organic remains are reviewed. There is little indisputable evidence of fossilised animals but there are more reliable indications of plants. Some of the hypotheses purporting to explain the dearth of Pre-Cambrian fossils are critically examined ; the only tenable explanation is one which is applicable to the world as a unit. Mention is made of Milne's cosmological model and of Haldane's biological deductions therefrom. The conclusion is reached that the appearance of animals with hard parts may be attributed, first, to the results developing from a variation in the rate at which energy is generated by chemical change, and, secondly, to radial evolution instead of to the classical model of the tree of evolution.

THE mediæval dogma that all fossils are special creations was discredited in the 18th century and, when the law of the order of superposition of rocks was acknowledged, a method of seeking the origin of life was clear for all to see. The early decades of the 19th century witnessed the establishment of the stratigraphical sequence, and thereby of the succession of life, from recent times as far back in geological history as the Old Red Sandstone. In this vast interval the amphibians, reptiles, birds and mammals had appeared on the Earth, and many animal and plant groups had risen to an acme only to be succeeded by a decline and extinction. The elucidation of the stratigraphy of the Transition Zone, which bridged the gap between the Old Red Sandstone and the crystalline rocks of the Primordial Zone, held a promise that the history of life could be followed far back in remote time and its very origin discovered. The results of the labours of Sedgwick and Murchison in Britain, of Barrande in Bohemia, and of Hall and Logan in North America have often been related, and their brilliant stratigraphical insight eventually led to an understanding of these complex strata. Older, and yet older, fossiliferous rocks were met, until the oldest fauna of the Cambrian with its remains of numerous and, in some cases, advanced animals was found to succeed a thick series of Pre-Cambrian sediments which are virtually unfossiliferous. Yet greater effort was directed to the uncovering of Pre-Cambrian faunas but without avail, and the hopes of discovering the origins of life dwindled. But why is it that Pre-Cambrian rocks carry no abundant evidence of organic remains when they may be unmetamorphosed and have all the appearances of proving to be fossiliferous? The answer to that question still defeats scientists. It will be as well, first, to survey generally the faunas of the Lower Cambrian and, secondly, to refer to the specimens claimed to be Pre-Cambrian fossils before reviewing the hypotheses which purport to explain their extreme scarcity.

I. Lower Cambrian Faunas

Raymond (1947, p. 23) has traced 455 species of fossils from the Lower Cambrian of the world. The allocation of these species to the different phyla is as follows: Porifera, in which are included the Archaeocyathinae, 84; Coelenterata, all of which are jellyfish, and Echinodermata, including rare cystids and edrioasteroids, 10; Vermes, including tubes, trails and burrows, 19; Brachiopoda, 125; Mollusca, comprising gastropods and hyolithids, 52; Arthropoda, 165, of which 133 are trilobites.

The fauna is varied but there is a notable absence of heavily shelled forms. Most shells or exoskeletons were composed of chitin or a comparable substance, but some brachiopods and the Archaeocyathinae were calcareous. Furthermore, most of the invertebrate phyla are represented, but many important groups, most of which in stratigraphically higher deposits are characteristically provided with thick, calcareous shells or calcareous colonies, are unknown in the Lower Cambrian; these are: Protozoa, but there are some doubtful records from the Lower Cambrian; corals and stromatoporoids; blastoids, crinoids, starfishes, and echinoids; Polyzoa, although problematical fragments have been attributed to this phylum; lamellibranchs; cephalopods.

II. Pre-Cambrian "Fossils"

In the majority of cases almost all palaeontologists would agree that a particular specimen from Cambrian or younger rocks is, or is not, a fossil. But it is otherwise with the so-called fossils of the Pre-Cambrian because opinion is invariably divided; such conflicting interpretation is of itself significant.

Discovered by Barrois at the end of the last century in carbonaceous quartzites interbedded with shales of the Pre-Cambrian Brioverian rocks of Brittany are small rounded bodies, 1μ—22μ in diameter, which have been claimed to be radiolaria by Cayeux (1894a, p. 203, pl. xi), but other palaeontologists have denied that these minute structures are organic in origin. Cayeux reiterated his belief in their radiolarian character when he had more material to hand (1929, p. 356). According to Deflandre (1949, p. 351), the systematic position of these micro-organisms remains uncertain; he expels them from the Radiolaria, but suggests they might be classified along with the Microhystrichosphaeridae. Cayeux also described objects which he identified as foraminifera (1894b, p. 116; 1894c, p. 1433) and as sponge-spicules (1895a, pp. 54–58; 1895b, p. 279), but here the structural evidence is far from convincing. Kerforne (1923, pp. 126, 131) has affirmed that the 'radiolarian' deposits and, indeed, other fossiliferous strata are really of Palaeozoic and not Pre-Cambrian age, and are preserved as infolds within the Brioverian rocks, but some continental geologists still maintain that Pre-Cambrian 'radiolaria' occur in Brittany and Normandy (Ters, 1937, pp. 11–12; Dangeard, 1951, p. 29; Pruvost, 1951, p. 61).

Two species of the problematical *Atikokania* have been described from the Pre-Cambrian of Ontario (Walcott, 1912, pp. 17–19). Additional and well-preserved material of one species proved on sectioning to consist of radiating quartz crystals embedded in a matrix of limestone; the second species, first ascribed by Walcott to the Archaeocyathinae and later referred to a spongoid form, is likewise probably inorganic (Raymond, 1947, p. 31).

Manchuriophycus (Endo, 1933, p. 47; Yabe, 1939, p. 205) from the Sinian of southern Manchuria was placed in the algae but, supposing it is organic in origin, it might be a worm-burrow. Trails of many kinds and non-annulated, sinuous, infilled burrows have been recorded by many authors from a variety of localities in other parts of the world, and, although these are notoriously difficult to interpret, they may in some cases indicate the existence of worms in Pre-Cambrian times (Fenton & Fenton, 1937, p. 1950; Faul, 1950, p. 103).

Horny brachiopods are recorded from the Vindhyan System of India.* The many species erected by Chapman (1935, p. 114) were reduced to one by Sahni (1935, p. 465), who doubted their brachiopod affinity; Howell expressed his opinion that they are algae (*in* Chapman, 1935, p. 113; see also Faul, 1950, p. 102). The specimens of *Lingulella montana* from the Belt Series of Algonkian age show a characteristic shape, and the concentric markings certainly have the appearance of growth-lines of brachiopods (Fenton & Fenton, 1936, pp. 616–7), but Cooper (*in* Shimer & Shrock, 1944, p. 284) considers there is no authenticated example of a Pre-Cambrian brachiopod.

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* Modern opinion is not in agreement on the Pre-Cambrian age of these rocks. Pascoe (1950, pp. 39–41) places the Vindhyan System in the Lower Palaeozoic.

Walcott described *Beltina danai* from the Belt Series and claimed it to be an arthropod (1899, p. 238); later (1911, p. 21, pl. 7), he illustrated additional specimens because they exhibited a tuberculate surface, which, he considered, showed their affinity with eurypterids. The illustrations are unconvincing and current opinion maintains that the material includes inorganic and organic matter, the latter being represented by the broken fronds probably of brown algae (White, 1929, p. 393; Fenton & Fenton, 1936, p. 616).

Protadelaidea was obtained from the lower division of the Adelaide Series by David and restored by Tillyard, who claimed for it a common ancestry with the eurypterids (David & Tillyard, 1936; David & Browne, 1950, pl. 8). Unfortunately, the illustrations are ineffective and the description gives no proof that the specimens are organic; there is a real possibility that they are inorganic and comprise ferruginous concretions of moderately uniform shape. That the interpretation of the specimens is difficult and uncertain is obvious from David's description of the state of preservation: "on account of the heavy leaching to which the rock has been subjected, as well as crushing and spreading of the rock-material under pressure, only very few of the fossils retain their original shape" (David & Tillyard, 1936, p. 41). The same uncertainty attends the "fossils" of arthropods, annelids and radiolarians previously reported by David (1928, p. 199).

Xenusion auerswaldae (Pompeckj, 1927) is a problematical fossil which shows affinities with annelids and arthropods. The specimen was collected from a glacial erratic; the rock has been compared with the Dala Sandstone of Sweden but its age cannot with certainty be proved to be Pre-Cambrian.

The supposed medusa from the Algonkian strata of Basalt Canyon in the eastern part of the Grand Canyon, Arizona, is the most acceptable animal fossil so far recorded from the Pre-Cambrian (Bassler, 1941, p. 519; Van Gundy, 1951, p. 957). The impression is 18 cms. in diameter, lobate, and shows a central mouth. There appears to be no doubt of the Pre-Cambrian age of the rocks which yielded the solitary specimen because about 12,000 feet of rocks elsewhere separate this stratigraphical horizon of the Algonkian from fossiliferous Lower Cambrian.

Evidence of plant-life is more acceptable than for animals but yet there is little that is undeniably genuine. Walcott was the first to propose that certain calcareous, banded structures present in Pre-Cambrian rocks, particularly in the Belt Series of Montana, were caused by lime-depositing algae; similar accretions have now been reported from many countries.* In his classical paper (Walcott, 1914, pp. 104–117), one genus was redescribed and eight new genera were defined; but unlike algal deposits of Ordovician or younger age, they do not show that structural detail which would be conclusive as to their origin—in fact, they might be inorganic. Holtedahl (1921) compared the inorganic and secondary concretions of the Magnesian Limestone of Durham with many of Walcott's figures and the correspondence is too close to be fortuitous; consequently, many of the 'algal' genera are now relegated to the rank of pseudofossil (Fenton & Fenton, 1936, p. 612). *Collenia* is still considered valid because it is clearly an original structure. Gruner (1923, p. 146; 1925, p. 151) has claimed the existence of blue-green algae of Huronian age in Minnesota.

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* See Faul (1950, p. 102) and Schaub (1950, pp. 19–21) for references.

Walcott also recorded fossil bacteria enclosed in calcareous algae; they are represented by strings of cell-like bodies each about 1μ in diameter (1915, p. 257). The preservation of bacteria is so improbable that few palaeontologists have been able to lend their authority to Walcott's discovery. On the other hand, the considerable thickness of banded iron-ore and chert of the Animikie Series might owe its origin at least in part to iron-depositing bacteria and algae (Gruner, 1922, p. 457).

There are few Pre-Cambrian structures which are unequivocally fossils but the fact remains that carbon, whether it be in the form of graphite, a modified anthracite, or a carbonaceous film, is not an unusual material and many localities show an abundance in the rocks. Carbonaceous substances have been interpreted as indicators of organic matter and in unaltered sediments there is no other obvious explanation. Some graphite, as for example in the Grenville Limestone, may possibly have originated "from carbon monoxide or carbon dioxide emanating from igneous rocks or from the carbon dioxide set free by the interaction of the limestone with silica emanating from intrusives" (Wilson, 1931, p. 121; 1939, p. 305). The carbon was liberated either by reaction of the oxides with hydrogen, or by two molecules of carbon monoxide producing carbon dioxide and making free the remaining carbon. Theoretically, inorganic carbon can be formed, but geologists have not accustomed themselves to the view that it is present in rocks generally in any significant amounts. A new technique has been applied by Rankama to the study of the proportion of carbon isotopes particularly in carbonaceous substances collected from the Pre-Cambrian rocks of Finland. Plants* tend to concentrate the lighter C^{12} isotope, and the heavier C^{13} is, for instance, concentrated in limestones (Nier &

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* Recently, Wickman (1952, p. 253), has determined the C^{12}/C^{13} ratio for 105 plants, and finds the figures range from 89.19–91.43. He concludes that the enrichment of the light carbon isotope is connected with the carbon dioxide cycle, and identifies the variation in the isotopic ratio of carbon primarily as an ecological problem.

Gulbransen, 1939, p. 697; Murphey & Nier, 1941, p. 771) and other carbonates (Wickman, Blix & von Ubisch, 1951, pp. 143–150). Rankama (1948a, p. 203) has determined from 100 samples that the C^{12}/C^{13} ratio in meteoric carbon is 89.8–92.0, in inorganic carbon 87.9–90.2, and in organic carbon 90.3–93.1.* In the Finnish rocks the carbonaceous segregations include *Corycium enigmaticum* from the Bothnian phyllites which Sederholm (1912, p. 516; 1924, p. 717; 1925, p. 350), in the face of intense opposition, unwaveringly maintained was organic and probably vegetable, and a seam, 6 feet thick, of a Jatulian anthracitic substance to which the name of shungite has been given. *Corycium* occurs in crinkled, elongated, sac-like bodies, circular in cross-section and usually distributed parallel to the bedding. The carbonaceous matter, which is less than 1 mm. thick, gave a proportion of 90–92.3 which undoubtedly shows it is organic carbon (Rankama, 1948b, p. 410). Shungite occurs in four varieties and in one the material is jet black, of an adamantine lustre and analyses 89.77% carbon (Sudovikov, 1937, p. 51). Metzger believes shungite to represent a genuine anthracitic coal-seam which accumulated as a sapropelic layer in mudstone (1924, pp. 62–64). The C^{12}/C^{13} ratio of 92.9 supports an organic origin (Rankama, 1948b, p. 413). At the moment, however, the data provided by the carbon isotopes should be accepted with caution, because doubt as to the validity of the conclusions made by Rankama and others has been expressed by Craig, who maintains that the chemical evidence is insufficient (1953, p. 84).

A review of the ' fossils ' of the Pre-Cambrian thus demonstrates that the medusa from the Grand Canyon is the only specimen which might be animal in origin, but among the plants there are reliable indications of algal masses. The implication that plants were antecedent to animals conforms with modern biological belief. The energy that is sunlight can be harnessed only by plants which construct from it carbohydrates, such as sugars and starches, and fats. In the presence of available phosphorus, nitrogen and sulphur, the plants manufacture complex proteins. Animals are thus forced to feed directly on plants, or on other animals which take plants as part or as the whole of their diet, because in these ways only can they obtain the substances essential to their life processes, that is, the carbohydrates, the fats and the proteins. As animals fundamentally depend on plants, it is improbable that they preceded them.

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* Mars (1951, p. 137) considers 91.3 to be the lowest value for organically formed carbon, but later determinations by Wickman (1952) for plants are not in agreement.

III. Hypotheses to explain Rarity of Pre-Cambrian Fossils

Many are the hypotheses which have been formulated to explain the dearth of organic remains in Pre-Cambrian rocks; only a few need be considered. The belief that metamorphism has destroyed all signs of fossils is no longer tenable, because great thicknesses of unaltered sedimentary rocks of many different kinds have now been found and investigated in several widely scattered parts of the world, and, if animals with hard parts had existed, there is no reason why some should not have come down to us as fossils.

(*a*) *Cambrian unconformity*

The base of the Cambrian has for too long been assumed to be marked by an unconformity approximately contemporaneous all over the world. The logical, but nevertheless unacceptable, inference to be drawn from such an assumption is that at the beginning of the Cambrian Period the surface of the world was almost covered by a shallow sea, and land was well nigh non-existent. That the Cambrian is unconformable, particularly in many of the classical areas which were studied first, is undeniable, and this relationship was seized upon by some to explain the emergence of Cambrian faunas. The time-interval connoted by this unconformity was claimed to be sufficiently long to permit of the development by rapid evolution of the many animal-groups represented in Cambrian faunas. The hypothesis found few advocates, it being difficult to accept that the unconformity marked an interval of time adequate not only for the origin and differentiation of animal-groups, but also for the evolution of highly developed organisms such as the trilobites and brachiopods. Latterly, a cogent counter argument has become available with the discovery that in some parts of the world the olenellid, or comparable, faunas are concordantly underlain by unfossiliferous rocks. Over a distance of 120 miles, from the Grand Canyon in the east to eastern California in the west, the vertical distance between the top of the *Olenellus* Zone and the underlying unconformity increases, and permits, first, the maximum expression of that zone, and secondly, in the Nopah Range, the appearance of 8,520 feet of unfossiliferous rocks between the base of the *Olenellus* Zone and the selfsame unconformity, which hitherto has been interpreted as marking the Cambrian—Pre-Cambrian junction (Wheeler, 1947, p. 155). Similarly, in the Appalachians, considerable thicknesses of sedimentary rocks, previously classed as Cambrian, are found below the lowest Cambrian fossiliferous horizon (Erwin Formation and Hesse Quartzite), and they lie unconformably upon a surface eroded in igneous and metamorphic rocks (Snyder, 1947, p. 149). In both the Cordilleran and Appalachian provinces, therefore, several thousand feet of unfossiliferous strata have been relegated to the Lower Cambrian on no firmer evidence than that they have an unconformity beneath them and a fossil-bearing Lower Cambrian sequence above them. These are the deposits laid down during the time-period of the Lipalian interval, and in Norway and Greenland have been called Eocambrian, and in North Africa and France Infracambrian (Menchikoff, 1949, p. 309, footnote) ; as Holtedahl observes (1952, p. 71, footnote), these stratigraphical terms are not synonymous.

Which of the data is the more reliable in correlation? For instance, are the strata yielding an olenellid fauna transgressive relative to the datum-line of the unconformity, or does the unconformity cut across time? Lower Cambrian faunas, although variable from place to place, if considered in a world picture are well-defined and specific. In the American Cordilleran province the *Olenellus* Zone can be correlated with confidence and can be equated within reasonably narrow limits. The unconformity thus proves to be an original land surface which persisted much later in time in the east of that province, in the Grand Canyon, than in the west, in eastern California, and is valueless in correlation. No longer can the unconformity be utilised as the time-interval during which animals with hard parts evolved, because it is separated, in the examples already mentioned and in some of those next to be considered, by many thousands of feet of sedimentary rock from the first acceptable, or Lower Cambrian, fauna.

Several other regions in the world exhibit either an upward gradation or a slight depositional gap between the sedimentary Pre-Cambrian and the Lower Cambrian. In northern China a core of gneisses and schists is unconformably covered by a vast series of sedimentary beds estimated to be about 18,500 feet thick. These comprise the Sinian Series which Kao and his co-workers describe as being disconformably overlain by the Lower Cambrian Manto Shale (1934, p. 249) ; Lee, however, extends the Lower Cambrian downwards to include the next subdivision, the Chengeryü Limestone, stating that it carries a *Redlichia* fauna and that there is no stratigraphical break (1939, p. 70). Whatever be the correct interpretation of the relationship in northern China, the Lower Cambrian is in unbroken sequence with the Sinian Series from the region of the Yangtze Gorge and south-west Hupeh in a south-westerly direction to eastern Yunnan (Lee, 1939, p. 87). On Ella Island, East Greenland, the fossiliferous Lower Cambrian is separated from the Tömmer Bay Group (topmost Eleonoren Bay Formation) by a disconformity (Schaub, 1950, p. 9). The hiatus is probably unimportant at this locality, but Messrs. Adams and Cowie have verbally informed me that the stratigraphical break becomes an unconformity to the north, and probably to the south, of Ella Island. Among other regions where the Lower Cambrian passes conformably down, or with a slight break, into a Pre-Cambrian succession are Norway (Eocambrian), Brittany (Brioverian), Montagne Noire, Leningrad, and South Australia (Adelaide Series) (Pruvost, 1951, p. 51).

(*b*) *Daly's hypothesis*

Daly was impressed by his visit in 1897 to the Black Sea where, under the direction of Androussov, he examined sea-bed samples containing calcium carbonate in a fine state of division. This had been precipitated by the interaction of calcium salts in solution with ammonia and ammonium carbonate " generated in the decay of multitudes of carcasses fallen from the surface layer to the bottom, where no scavengers could live and thus prevent the putrefaction " (Daly, 1912a, p. 503; 1912b, pp. 643–675, which contains references to earlier publications). As a result of this experience Daly constructed his hypothesis which attempted to explain why Pre-Cambrian organisms carried no hard parts and hence are not found as fossils. He argued that the annual contribution of calcium salts from the land to the oceans was small as compared with the rapidity by which these salts, in the absence of scavengers, could be deposited as calcium carbonate under Black Sea, or comparable, conditions which he believed then existed. So complete was this deposition that the seas were rendered limeless. The post-Huronian orogeny, however, exposed a great area of land to denudation, including some of the limestones already formed, and thus the annual contribution of calcium to the oceans was greatly increased; there was an excess, which was available to marine organisms and from which they secreted hard parts suitable for preservation in rocks. The hypothesis involves the *world-wide* persistence of poisoned water conditions and it demands the maintenance of density stratification in all oceans, otherwise a surface layer with teeming but naked life could not exist on top of a zone of foetid water. The post-Huronian orogeny was not world-wide in its occurrence and, during the long history of the Pre-Cambrian, large surfaces must have been laid bare in different parts of the world and eroded at many varying times; furthermore, the pre-Huronian unconformity is probably of greater importance and represents peneplanation on an enormous scale. Be this as it may, there was ample time for Pre-Cambrian animals and plants to form hard parts if lime was made accessible to them either at the beginning, or by the end, of the Huronian, and yet they have not been found. The naive argument that there must have been a lime famine even in Cambrian seas because the trilobites and most of the brachiopods have a chitinous shell unnecessarily presupposes that these animals would have secreted a hard calcareous shell if ample lime had been available.

(*c*) *Lane's hypothesis*

Lane's hypothesis is founded on the premise that the oceans of the world in their early history were rich in chlorides, including iron chloride, and were thereby markedly acid (1917, p. 45). Whether these acid conditions prevented calcareous secretion, as Lane contends, or not, the essential factor is that low pH values would almost certainly be intolerant to any form of abundant life. Nevertheless, the great pile of calcareous material comprising the Grenville Limestone is attributed by Lane to organic activity. The theory again does not join issue with the real problem because there was ample Pre-Cambrian time during which chemical environments suitable for calcareous secretion could have been established.

(*d*) *Termiers' hypothesis*

After a study of the sedimentary rocks of Pre-Cambrian age in the Canadian, Baltic and African Shields, the Termiers founded their hypothesis on the conclusion, which does not materially differ from an opinion expressed earlier by Walcott (1910, p. 2), that the majority of the rocks are continental, lagoonal, littoral or marine in origin, and that the marine sediments accumulated in shallow epicontinental seas (Termier & Termier, 1949, p. 83). These environments, they argue, are not conducive to the preservation of organisms, excepting the stromatoliths, which might even have grown in saline lakes. The remains of Pre-Cambrian life must be sought in deposits of the deeper oceans, and Pruvost suggests a European " mésogée ", assumed to have separated the Baltic and African Shields, and an American " mésogée " encircling the Canadian Shield (1951, p. 55). Apart from the convenience to the hypothesis of confining evidence of a Pre-Cambrian biota to deeper oceans, of which there is no certain information from any locality in the world, the main obstacle in accepting the hypothesis is the probability that animals with hard parts (if living in late Pre-Cambrian times) would have flourished in the littoral and shallow seas at least as much as, or possibly more than, in the deeper seas.

(*e*) *Brooks' hypothesis and Raymond's modification*

Brooks (1894, p. 469) was convinced that animals already possessed a long history prior to the dawn of Cambrian time and he did not doubt that when the primaeval seas became populated by animals and plants it was the surface waters that carried life long before the deeper waters or the sea-floor. The evolutionary development was slow and thus the primitive fauna comprised minute and simple pelagic organisms. Then, near the beginning of Cambrian times, by way of the deep seas, these soft-bodied organisms eventually discovered and began to populate the shallow sea-floor ; the freedom of the open seas was replaced by competition which became more and more intense, and the secretion of hard parts became a protective measure. In such a manner as this, organisms built up structures which were suitable for petrifaction. Many biologists nowadays favour an origin of life in shallow water along shorelines and not in the surface water of big oceans, but it might be said that this is no valid criticism because opinion might change again in the next few years. Brooks does not explain, or account for, certain fundamental difficulties. For example, what were the factors which developed a somewhat sudden sense, according to Brooks, for the colonisation of the shallow sea-bed among nearly all the phyla of the invertebrates and among some plants ? Whatever they were, what is difficult to explain is that their impact was apparently world-wide and, geologically speaking, contemporaneous.

Raymond (1935, p. 390 ; 1947, p. 36) modified Brooks' hypothesis, and likened the production of a calcareous skeleton to a kind of pathological condition induced by inactivity ; he argued that Pre-Cambrian animals were pelagic and lacked hard parts because, as he thought, they were motile and untroubled by predators. He correctly maintained that thick calcareous shells did not appear in force until Ordovician times and assumed that a sessile mode of life " was a novelty, newly discovered in Cambrian times ". Raymond's opinion is diametrically opposed to the biological implications of Milne's cosmological theory as deduced by Haldane and next to be considered.

(*f*) *Haldane's contribution*

Some sequence of events was clearly operative upon the unit of the world during primaeval times and it should be noted that an unconsciously expressed demand for a *world-wide* happening is inherent to all the hypotheses yet mentioned. No real advance is probable while efforts are made to explain events which are recorded merely as a part of the world's history at a certain time and at a defined place.

At this stage it is apposite to consider a short, but all the more provocative, letter from Haldane (1944, p. 555). Milne's cosmological theory describes events either on the *t*-scale, where the spiral nebulae are receding and matter is expanding, or on the τ-scale, where there is no recession of nebulae and matter is not expanding. If the *t*-scale is applied to geological problems, the length of day, say, in palaeozoic times was much shorter than it is now, and the size of objects would have been smaller ; but the rate at which energy is liberated in a chemical change is constant on the *t*-scale, whereas on the τ-scale it increases. Haldane maintains that it is the τ-scale which most suitably expresses geological and biological science. He claims that, in the past, chemical change was a more inefficient source of energy than it is to-day and argues that " at a sufficiently early stage, a living organism would have been unable to provide even the small energy needed for cell division or amoeboid movements ". 690 million years ago the " energy for motion would only have been generated at half its present rate ". Thus the rate at which chemical change produced energy becomes the controlling factor, and may have permitted only in late Pre-Cambrian time the existence of organisms of a simple kind ; when the rate increased, more active animals like swimmers and crawlers could have existed.

IV. CONCLUSION

Milne's cosmological model employing the τ-scale provides a world-wide control which is not only external to the Earth but is also an essential part of it ; the danger lies in the possibility that the model is wrong. Assuming the correctness of Milne's theory and of Haldane's biological deductions, active animals could not have existed in late Pre-Cambrian (Eocambrian) history owing to the low level of chemically produced energy. Predators, either crawling or swimming, would have been absent, and animals, not being physically in the position of becoming competitors or enemies, would have needed no protective armour. More virile animals appeared as the speed of metabolism increased with the increase in rate at which energy was freed by chemical reactions ; life became competitive, leading to a demand for a hard covering, which is assumed to have developed approximately with the beginning of the Cambrian Period, some 520 million years ago. Even at that time there existed few animals which were encased within a thick calcareous shell, and it was only at the beginning of the Ordovician Period that this type of protection became commonplace.

The τ-scale, however, does not explain the diverse and varied structures shown by the Lower Cambrian faunas so long as scientists accept as a truism the classical model of evolution—the tree of evolution which implies a linear series with some lateral, but fundamentally unimportant, offshoots. Unicellular animals, on *a priori* reasoning, are more primitive than those with a primary double layer of ectoderm and endoderm, but there appears to be nothing in embryology which refutes the proposal that the formation of the mesoderm and the production of the coelom occurred in several radiating lines of evolution, which need not be directly related except in that they arose from two-layered ancestors. The Mollusca might have progressed along one line during approximately the same period of Pre-Cambrian time as the segmented worms and arthropods, while the Molluscoidea underwent another geologically contemporaneous change, and the Echinodermata yet another. The tempo of evolution was, also, not necessarily the same for each group. If it is possible to accept radial, instead of linear evolution, the lengthy duration of previous history normally demanded for the rise of the complicated animal-types which frequented Lower Cambrian seas is not a necessity.

The controls exercised, first, by the increased energy liberated by the speeding up of the rate of chemical change, and, secondly, by radial evolution resulting in the different categories of coelomate animals are suggested as an explanation of the appearance of organisms with protective covering at about the time connoted by the deposition of Lower Cambrian sediments.

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BRISTOL BOTANY IN 1952

By Cecil I. and N. Y. Sandwith

(*Received, and read in title to Council, Feb. 19, 1953.*)

THE year 1952 was notable for excessive rainfall in this district. January was cold, with some snow, a thunderstorm and intervals of sunshine. February was exceptionally dry, with eighteen rainless days, some of them sunny, and little snow. The partial eclipse of the sun on the 26th, which was observed at 10.0 a.m. and lasted an hour, was unforgettable for, while the sun became thinly veiled in cloud, the aureola was scintillating and the sky was suffused with a soft pink atmosphere from which Christ Church, Clifton, spire and distant City buildings stood out clearly. This was a remarkable effect, as the sky to the north-west, opposite the sun, was bathed in dense fog. After a moderately wet March and April, May was warm and sunny with thundery weather, but June was wet, with thunderstorms, cold winds and occasional fog. July was the driest month, with a heat wave in the first week, when a thunderstorm on the 6th was welcome. After a rainy August the long winter of 1952–1953 may be said to have begun in September, which was unusually cold and wet, and the last quarter of the year will be remembered for its rain, snow, frost, fogs, and general cold and dreariness.

For the first time for many years we are able to do justice to the Gloucestershire side of our area. A new contributor, Mr. G. W. Garlick, has kindly sent us a long list of valuable records from the neighbourhood of Horton, Hawkesbury, the Lower Woods east of Wickwar, and Chipping Sodbury. This is an interesting region with a wide variety of soils and plant habitats, which was insufficiently explored by Mr. White and his contemporaries. Mr. Garlick's list fills gaps in the distributions of very many species, and we are glad to make a selection from his notes, giving his localities in a necessarily abbreviated form, and his name as " G.W.G. ".

Helleborus viridis L. var. *occidentalis* Rouy et Fouc. Over about half-an-acre at the N.W. end of Hillclose Brake, Hawkesbury, and a few plants in Hawkesbury Warren, **G.**, *G.W.G.*

Nuphar lutea (L.) Sm. Pond in cornfield near Bodkin Hazel Wood, east of Horton, **G.**, *G.W.G.*

Cardamine impatiens L. Shrubbery, Priston Rectory, **S.**, *Mrs. E. M. E. Bell.*

Cochlearia danica L. Known for many years near Montpelier Railway Station, Bristol, **G.**, *I. W. Evans.*

C. anglica L. Lower Lighthouse Marsh, Berrow, **S.**, *O. M. Hallam,* see *Rep. Bot. Sect., Som. Arch. and Nat. Hist. Soc.* for 1951.

Lepidium Smithii Hook. Froglane Pit, Coalpit Heath, **G.**, *I. W. Evans.*

Melandrium noctiflorum (L.) Fr. Cornfield between Hawkesbury Upton and Hillesley, **G.**, *G.W.G.*

Arenaria leptoclados (Reichb.) Guss. Horton and Kilcot, **G.**, *G.W.G.*

Hypericum Androsaemum L. Winscombe Hill, **S.**, *J. P. M. Brenan.*

Linum bienne Mill. Rocky slope of the Downs opposite the Zoological Gardens, Clifton, **G.**, *G.W.G.* In two spots at Horton, **G.**, *G.W.G.*

Impatiens capensis Meerb. By the towpath under Leigh Woods, **S.**, 1951, shown to *G.W.G.* by *Mr. Wensley*, of Wellington Cottage.

Ononis spinosa L. The white-flowered form was found on Inglestone Common, **G.**, *G.W.G.*, and on a bank by the Channel near Easton-in-Gordano, **S.**, 1920, *C.I.S.* and *N.Y.S.*

Medicago lupulina L. " var." *unguiculata* Rchb. This curious sport, mentioned without a name in *White, Fl.*, p. 229, has been found near Hawkesbury, **G.**, 1939, *I. W. Evans* ; and was collected by ourselves in 1920 on the edge of Weston Big Wood, Portishead, **S.**

Melilotus altissima Thuill. Frequent in the Lower Woods, east of Wickwar, **G.**, *G.W.G.*

Astragalus glycyphyllos L. Edge of Hennel Wood, Kilcot, **G.**, *G.W.G.*

Vicia sepium L. With cream-coloured flowers at the south edge of Bodkin Hazel Wood, **G.**, *G.W.G.* ; and on the hillside above Clapton-in-Gordano, **S.**, 1930, *C.I.S.* and *N.Y.S.*

Agrimonia odorata (Gouan) Mill. In several spots in the Lower Woods area, east of Wickwar, **G.**, *G.W.G.*

Sorbus eminens E. F. Warburg. This segregate from *S. Aria* is described, with a figure of a leaf, in the new British Flora by Clapham, Tutin and Warburg. One of its two areas of distribution is the Avon Gorge, where it is known on the Gloucestershire side.

S. porrigentiformis E. F. Warburg. Small, gnarled trees on limestone crags on the north side of Compton Hill near Winscombe, **S.**, *J. P. M. Brenan.* This new species is the Mendip "*P. rupicola Syme*" of *White, Fl.*, p. 307, which was later referred to *Sorbus porrigens* Hedl. The trees in Burrington Combe should now be named *S. porrigentiformis* ; also, presumably, those at Sandford, Callow Rocks and Cheddar, on which the records of *P. rupicola* were based.

S. intermedia (Ehrh.) Pers. By the towpath, Conham, **G.**, *I. W. Evans.* First record for the Gloucestershire side of this introduced, often planted or bird-sown, tree.

Crataegus oxyacanthoides Thuill. The accuracy of the first record from our area, from Tickenham Moor, **S.**, 1909, *Miss Livett* (*White, Fl.*, p. 299), has been doubted by several botanists, as the locality was a most unlikely one for this species, and it has not been noted there by subsequent observers. It was significant that Mr. White wrote that the leaves of the Tickenham *oxyacanthoides* "show no marked peculiarity in shape." No voucher specimen could be found in the White or Bucknall Herbaria at Bristol University, but material referred to *C. oxyacanthoides* and labelled "Tickenham Moor, October, 1909, Miss Livett," was in Miss Roper's herbarium at Leeds University, and was kindly lent to us by Dr. W. A. Sledge. The specimen is quite certainly a form of *C. monogyna* Jacq. Fortunately, there is undoubted evidence (verified by specimens) of the occurrence of a bush of *C. oxyacanthoides* in one locality on the Somerset side of the district, see Mr. D. Coombe's record from Odd Down, Bath, published in "Bristol Botany for 1944." Mr. G. W. Garlick has two new localities on the Gloucestershire side, *viz.*, middle of Sodbury Common, and (one bush) foot of Trinity Lane, Sodbury.

Cotoneaster microphylla Lindl. Limestone crags on north side of Compton Hill near Winscombe, **S.**, *J. P. M. Brenan.*

C. horizontalis Decne. One small, horizontally spreading shrub among limestone rocks on the west side of Crook Peak, **S.**, *J. P. M. Brenan.*

C. Simonsii Baker. Several localities on slopes of the Avon Gorge, Clifton ; and on railway embankment, Chipping Sodbury, **G.**, *G.W.G.* Woodland between Tickenham and Wraxall, **S.**, *C.I.S.*

Ribes rubrum L. Several localities at Horton and Hawkesbury, **G.**, *G.W.G.*

Sedum Telephium L. Lane-bank, Bodden, near Doulting, **S.**, *J. P. M. Brenan.*

S. dasyphyllum L. On rocks below the towpath immediately beneath the Clifton Suspension Bridge, **S.**, *G.W.G.*

Epilobium adenocaulon Hsskn. In two spots near Doulting, **S.**, *J. P. M. Brenan.*

Œnothera parviflora L. Specimens of a very distinct, small-flowered *Œnothera*, growing with *Œ. biennis* L. on sandhills north of Berrow Church, **S.**, were collected by us in July, 1951, and identified as the above by the American specialist, Prof. P. A. Munz. The petals of these specimens were only 1.5–1.8 cm. long, the rosette leaves had withered away, the stems were red with red tubercles, and the stem leaves were narrowly elliptic-lanceolate. Apart from *Œ. stricta* Ledeb., we have seen three species of Evening Primrose on the Burnham and Berrow sandhills, *viz.*, *Œ. biennis*, *Œ. parviflora* and the large-flowered *Œ. erythrosepala* Borbás (*Œ. Lamarkiana* De Vr., *non* Ser.).

Sison Amomum L. Roadsides and lanes, Totteroak, Horton, **G.**, *G.W.G.*

Symphoricarpos rivularis Suksd. Lane, Yate Lower Common, **G.**, *C.I.S.* East end of Mapleridge Lane, Horton ; and hedgerow, Kilcot, **G.**, *G.W.G.*

Lonicera japonica Thunb. is established in a hedge on the slope behind Knightswood Cottages, Tickenham, **S.**, *C.I.S.*

Erigeron canadensis L. Wall, Chipping Sodbury ; and quarry at top of Horton Hill, **G.**, *G.W.G.*

Senecis squalidus L. Housing estate, Chipping Sodbury ; and edge of cornfield, Totteroak, Horton, **G.**, *G.W.G.*

Carlina vulgaris L. Railway embankment, Chipping Sodbury, **G.**, *G.W.G.*

Cirsium eriophorum (L.) Scop. ssp. *britannicum* Petrak. Railway embankment, Chipping Sodbury ; and Sturt Coppice, Lower Woods, **G.**, *G.W.G.*

Hieracium acuminatum Jord. St. Vincent's Rocks, **G.**, *C. C. Townsend,* det. *P.D. Sell* and *C. West.* This is a microspecies recognised in Pugsley's *Prodromus*, closely related to the very common *H. Lachenalii* Gmel.

H. maculatum Sm. Railway embankment, Chipping Sodbury, **G.**, *G.W.G.* Roadside opposite Mendip Lodge, Cranmore, **S.**, *C.I.S.*

Cyclamen neapolitanum Ten. Large colonies have been noted by Clevedon members of the *Wild Flower Society* in the undergrowth and ivy of woodland on slopes above Tickenham, near Cadbury Camp, **S.**, but these must have originated from one of the many small properties in the immediate vicinity.

Symphytum grandiflorum DC. Lane near the top of Horton Hill, **G.**, *G.W.G.* An early-flowering, low-growing species from the Caucasus, well known in shrubberies, where it forms large patches. The buds are brick-red, the corolla cream and more or less brick-red at the tip.

Anchusa sempervirens L. A form with strikingly narrow stem leaves, not broadly ovate as is usual in Britain, was found on a ballast heap below Winterbourne Down, **G.**, by *Major G. MacGeorge.* This matches a specimen in the Kew Herbarium sent from the Cambridge Botanic Garden in May, 1916, and identified as " *Caryolopha sempervirens* ", without comment, by the Roumanian specialist, M. Guşuleac. Some Spanish specimens are also similar. French authors describe the leaves of this species as oval-lanceolate, and no doubt there is a range of variation on the Continent which is not equalled here, where our introduced colonies must have come from a limited number of sources. For an article on the distribution and status of *A. sempervirens* in South Devon, see *Watsonia*, i. pt. V, 308–312 (1950).

Lithospermum arvense L. Cornfield, S.W. corner of Bodkin Hazel Wood, **G.**, *G.W.G.*

Calystegia sepium (L.) R. et S. var. *americana* (Sims) Kitag. (var. *colorata* Lge.). Bank by a ditch by the road between Wickwar and Chipping Sodbury, **G.**, *C.I.S.* Corolla a delicate mauve-pink.

Solanum nigrum L. Garden weed, Chipping Sodbury, **G.**, *G.W.G.*

Linaria purpurea (L.) Mill. Highfield Lane, Hawkesbury Upton ; and top of Hinton Hill, **G.**, *G.W.G.*

Mimulus guttatus DC. Stream near Bushes Farm, Horton, **G.**, *G.W.G.*

Veronica filiformis Sm. Hedgerow, Portway Lane, Old Sodbury ; and cart-track, Bangel Wood, Kilcot, **G.**, *G.W.G.*

V. scutellata L. N.E. corner of Sodbury Common, **G.**, *G.W.G.*

V. Anagallis-aquatica L. and *V. catenata* Pennell (*V. aquatica* Bernh., *non* S. F. Gray). Mr. Garlick finds both species on Sodbury and Inglestone Commons, near Horton, and at Yate Rocks, **G.**

Euphrasia brevipila Burnat et Gremli forma *subeglandulosa* Buckn. Between Chelynch and Doulting, **S.**, *J. P. M. Brenan.*

E. pseudo-Kerneri Pugsl. Bath, **S.**, 1830, without collector's name, in *Herb. C. C. Babington,* in the Cambridge University

Herbarium, det. *P. F. Yeo*, see *Watsonia*, ii. pt. V, 348 (1953). First record for the district, but specimens formerly referred to *E. Kerneri* Wettst. should be re-examined.

Rhinanthus calcareus Wilmott. Hillside above Wotton-under-Edge, **G.**, 1948, *C. C. Townsend*, see *Watsonia*, *loc. cit.* (1953). A late-flowering species of calcareous grassland, recognized by its very narrow leaves. New to the district.

Orobanche Hederae Duby. Bowling Hill, Chipping Sodbury, **G.**, *G.W.G.*

Lathraea Squamaria L. Yate Rocks, and Bodkin Hazel Wood, **G.**, *G.W.G.*

Mentha × *cordifolia* Opiz. Waste ground between Chelynch and Doulting, **S.**, *J. P. M. Brenan*, det. *R. Graham.*

Thymus pulegioides L. Steep pasture, Chandler's Cliff, Hillesley, **G.**, *G.W.G.*

Stachys officinalis (L.) Trev. Mr. Garlick finds the uncommon white-flowered form in several spots in the Lower Woods, **G.**

S. arvensis L. Bury Hill, Winterbourne, **G.**, *G.W.G.*

Lamium album L. forma *erubescens* Wats. ex C. E. Salmon. Horton and Chipping Sodbury, **G.**, *G.W.G.*

Plantago lanceolata L. var. *anthoviridis* W. Wats. Froglane Pit, Coalpit Heath, **G.**, *I. W. Evans.*

P. major L. A fine, sporting specimen with a compound inflorescence of bipinnately arranged spikes was collected in a cornfield at Little Stoke, Stoke Gifford, **G.**, by *Mrs. M. L. Davis.*

Chenopodium polyspermum L. and *C. rubrum* L. are frequent at Horton, the latter also at Hawkesbury, **G.**, *G.W.G.*

Polygonum nodosum Pers. Rubbish-tip by Portway below Sneyd Park, **G.**, *C. C. Townsend.* The first published record for the Gloucestershire side of the district.

Daphne Laureola L. Abundant in woods at Kilcot, **G.**, *G.W.G.*

Euphorbia Lathyrus L. In three localities at Chipping Sodbury, **G.**, *G.W.G.*

Humulus Lupulus L. Climbing over bushes on Observatory Hill, Clifton, **G.**, *C.I.S.* Hedge at Priston, **S.**, *Mrs. E. M. E. Bell.*

Carpinus Betulus L. Littley Wood ; and Walk Wood, Horton, **G.**, *G.W.G.*

Ceratophyllum demersum L. Spa Pools, Yate ; and pond near Bodkin Hazel Wood, **G.**, *G.W.G.*

Epipactis purpurata Sm. Stoneybridge Wood, Lower Woods, **G.**, *G.W.G.* A welcome second station for this local species.

E. Helleborine (L.) Crantz. Several spots in the Lower Woods, and near Hillesley, **G.**, *G.W.G.*

Orchis ericetorum (Linton) E. S. Marshall. Michael Wood, east of Hill; and between Hill and Rockhampton, **G.**, *E. Nelmes*, see specimens in Herb. Kew., and *Fl. Glos.*, p. 452. Summit of Stinchcombe Hill, **G.**, *C. Thomas*, *ibid.* These are the first records in " Bristol Botany " notes for the Gloucestershire side of the district. A hybrid, *O. ericetorum* × *praetermissa*, was also found by Mr. Nelmes at both Hill and Rockhampton, see *Fl. Glos.*, *loc. cit.*

Allium oleraceum L. Uphill, **S.**, *E. J. Hamlin*, see *Rep. Bot. Sect., Som. Arch. and Nat. Hist. Soc.* for 1951.

Gagea lutea (L.) Ker-Gawl. Bodkin Hazel Wood, **G.**, *G.W.G.*, who writes, "According to Mrs. Harford, the wood is sometimes yellow with the flowers."

Juncus compressus Jacq. Kingrove Common, and N.W. of Little Sodbury, **G.**, *G.W.G.*

J. tenuis Willd. By a pool on the Mendip Golf Course, Maesbury Castle, near Shepton Mallet, **S.**, *J. P. M. Brenan.*

Typha latifolia L. Spa Pools, Yate; and old millpond, Whitewell Bottom, Kilcot, **G.**, *G.W.G.*

Lemna trisulca L. Ponds, Totteroak, Horton; and near Bodkin Hazel Wood, **G.**, *G.W.G.*

Wolffia arrhiza (L.) Wimm. Dykes on Puxton Moor, **S.**, *C.I.S.* and *N.Y.S.* This species by now has so many localities on our North Somerset levels that it may be classed as " frequent and well distributed " on them.

Alisma lanceolatum With. Lower Woods; and Vinney's Lane, Horton, **G.**, *G.W.G.* Dyke in the flats between Puxton and Sandford, **S.**, *C.I.S.* and *N.Y.S.*

Scirpus setaceus L. Lower Woods; and Withymore Wood near Hillesley, **G.**, *G.W.G.*

Carex × *Kneuckeriana* Zahn (*C. axillaris* Good.). Path by the Little Avon opposite Lower Wetmoor, Lower Woods, **G.**, *G.W.G.*

C. acuta L. Abundant with *C. disticha* Huds. in a drain in fields by the River Frome above Hatter's Lane Bridge, Chipping Sodbury, **G.**, *G.W.G.* Dune-marsh near Berrow Church, **S.**, *I. W. Evans.*

C. pilulifera L. Frequent in the Lower Woods area, **G.**, *G.W.G.*

C. lepidocarpa Tausch. Hillesley, **G.**, 1908, *Miss I. M. Roper*, *vide spn.* in *Herb. Butt*, det. *E. Nelmes*, see *Fl. Glos.*, *p.* 513. The locality was doubtless Whitewell Bottom, near Kilcot, where *Mr. I. W. Evans* collected this species in 1950.

Spartina × *Townsendii* H. et J. Groves. Uphill, **S.**, see *Rep. Bot. Sect., Som. Arch. and Nat. Hist. Soc.* for 1951.

Phalaris arundinacea L. var. *picta* L. Roadside, Widdin Hill Farm, Horton, **G.**, *G.W.G.*

Calamagrostis Epigeios (L.) Roth. Little Sodbury, and throughout the Lower Woods, **G.**, *G.W.G.*

Sieglingia decumbens (L.) Bernh. Lower Woods, and Yate Rocks, **G.**, *G.W.G.*

Glyceria declinata Bréb. By a pond in the flats between Puxton and Sandford, **S.**, *C.I.S.* and *N.Y.S.* In a pool on the Mendip Golf Course, Maesbury Castle, near Shepton Mallet, **S.**, *J. P. M. Brenan.*

Brachypodium pinnatum (L.) Beauv. A few plants on ant-hills in a field N. of Bedford's Wood, Lower Woods, **G.**, *G.W.G.*

Adiantum Capillus-Veneris L. With *Ceterach* and *Asplenium Ruta-muraria* in masonry of the old platform at the derelict railway station at Wrington, **S.**, *Miss E. Rawlins.*

Blechnum Spicant L. Lower Woods, **G.**, *G.W.G.*

Dryopteris Borreri Newm. Horton Bushes, **G.**, *G.W.G.*, confirmed by *A. H. G. Alston* and *P. Taylor.* The first record for the Gloucestershire side of the district.

Polystichum lobatum (L.) Roth and *P. setiferum* (Forsk.) Woynar. Lower Woods, Hawkesbury, Horton, Kilcot and Hillesley, **G.**, *G.W.G.*

Thelypteris Phegopteris (L.) Slosson. Leigh Woods, **S.**, 1951, *G.W.G.* In September, 1952, Mr. Garlick guided the junior writer to his remarkable discovery. A small patch of the Beech Fern is growing in rich humus on the moist bank of a depression in an unfrequented part of the Woods. Associated species are *Oxalis Acetosella*, *Dryopteris Filix-mas* and *D. aristata.* There is no reason to suppose that this is not a genuine native station.

Chara globularis Thuill. var. *capillacea* (Thuill.) Zanev. (*C. fragilis* Desv.). Field-pond near S.W. corner of Bodkin Hazel Wood, **G.**, *G.W.G.*, det. *G. O. Allen.*

ALIENS. *Messrs. C. C. Townsend* and *C. W. Bannister* and the *Rev. R. B. Abell* had one very successful day at Avonmouth Dock, **G.**, finding two North American grasses new to Britain, *viz.*, *Eriochloa contracta* Hitchc. and *Eragrostis pectinacea* (Michx.) Nees, both det. *C. E. Hubbard.* Two further species were new to the Bristol list, *Salvia reflexa* Hornem. (N. America) and the true *Galinsoga parviflora* Cav. (hitherto, only *G. ciliata* had been collected at Bristol). Other noteworthy casuals were *Brassica Tournefortii* Gouan, *Lythrum meonanthum* Lk., *Eragrostis cilianensis* (All.) Vig.-Lut., *Hordeum hystrix* Roth and *Avena fatua* L. var. *pilosa* Syme (a variety which has not previously been recorded). The same botanists found *Sorghum vulgare* Pers., *sens. lat.*, on the tip by Portway below Sneyd Park, **G.**

Interesting aliens recently collected by *Mr. I. W. Evans* were *Rubus laciniatus* Willd., a first record for Bristol, on waste land at Brislington, **S.** ; *Anthemis tinctoria* L., on the Ashton tip, **S.**, in 1941 ; and *Amaranthus vulgatissimus* Speg. and *Chenopodium polyspermum* L. var. *cymosum* Chevall., at St. Anne's, **S.**, in 1952. *Mrs. M. L. Davis* found *Silene pendula* L. on a blitzed site in Wine Street, Bristol, **G.**, and *Galinsoga ciliata* (Raf.)Blake in her garden at Little Stoke, Patchway, **G.** The last-named species was noted by *Mr. J. P. M. Brenan* on railway sidings at Frome, **S.**

Silene Behen L. and *Ammi majus* L. occurred on a tip at Hambrook, **G.**, *Major G. MacGeorge.*

BRYOPHYTES. *Cryptothallus mirabilis* von Malmb. This extraordinary saprophytic liverwort was discovered in April, 1952, on Ashcott Heath, **S.**, by *C.I.S.* This is the third station recorded for England. *C. mirabilis* was first described from Swedish specimens in 1933. In 1948 it was found in Scotland, where it is known in two counties, and more recently it has been detected in Surrey and Westmorland. The plant has a white, lobed thallus, and is usually found in peat beneath a litter of sphagnum. A full account of it appeared in the *Transactions of the British Bryological Society*, Vol. i, pt. 4, pp. 357–366 (1950), and the senior writer hopes to contribute an extended note describing the Somerset peat moor habitat to the same publication.

Pallavicinia Lyellii (Hook.) Gray was found by *Mr. E. D. Evens* in a second locality on the peat moor, on Ashcott Heath, **S.** *Sphagnum squarrosum* Pers. ex Crome was collected by the writers on Ashcott Heath, **S.**, and is apparently new to vice-county 6. The specimens were identified by Miss J. Taylor, of the Kew Herbarium, and by Dr. E. W. Jones. The species is associated with *Cryptothallus mirabilis.*

ADDITIONS TO THE FLORA OF DENNY (v.-c. 35). Mrs. M. L. Davis visited Denny Island on June 16, 1951, and again on June 14, 1952, and has made the following useful additions to the flora : *Ranunculus repens* L., *Cochlearia officinalis* L., *C. danica* L., *Stellaria media* (L.) Vill., *Spergularia salina* J. et C.

Presl, *Umbilicus rupestris* (Salisb.) Dandy, *Plantago major* L., *P. Coronopus* L., *Polygonum aviculare* L., *Avena sativa* L., *Dactylis glomerata* L., *Agropyron repens* (L.) Beauv. and *Lolium multiflorum* Lam. These are not found in the lists of Matthews and of Welch and Kellaway (cf. " Bristol Botany in 1949.").

ADDITIONS TO THE FLORA OF STEEP HOLM. On June 10, 1952, Messrs. W. R. Price and J. Cripps spent some hours on Steep Holm, **S.**, and Mr. Price collected three species which are not mentioned in previous lists of plants found on this island. They are *Sagina maritima* Sm. (det. *J. P. M. Brenan*), *Carduus tenuiflorus* Curt. and *Mercurialis annua* L.

ORNITHOLOGICAL NOTES, BRISTOL DISTRICT, 1952

COMPILED FROM REPORTS OF MEMBERS OF THE B.N.S. ORNITHOLOGICAL SECTION

By H. H. DAVIS, M.B.O.U. and P. J. CHADWICK

(*Read in title to Council, Feb. 19, 1953. Received for publication, Feb. 27, 1953.*)

CONTRIBUTIONS for 1952 are from more than fifty observers, to all of whom full acknowledgment is due. Records are no less interesting than in previous years, among them being those of a Wryneck at Clifton in March ; a Fulmar off Steep Holm in May ; Quail at Dyrham, June–August, and at Aust in August ; a Hen Harrier at Brean Down, a Great Grey Shrike at Clevedon and a Scarlet Grosbeak at Cheddar—all in October. A Hoopoe was reported for the sixth consecutive year—one being watched on a lawn at Whitchurch in April, and at the New Grounds a Glaucous Gull was seen in February ; a Blue-headed Wagtail in April ; and a Short-eared Owl in December.

An outstanding event was the remarkable autumn influx of Leach's Petrels, and with them a very small proportion of Storm Petrels. The birds, driven by widespread gales in the North Atlantic, appeared first on the south Irish coast, October 21, and by the 26th were literally swarming in the Bristol Channel and Severn Estuary. Many were found dead or dying, both on coastal reaches and inland, during a disastrous ‘ wreck ’, which extended ultimately to almost all parts of the British Isles.

Noteworthy visitors to the reservoirs were a Shag at Cheddar, January–February and August, and at the same place, Great Northern Divers in January and December, and a Scandinavian Lesser Black-back in March. Duck census returns yielded record numbers of Pochard at Cheddar, and of Teal, Wigeon, Goldeneye and Goosander at Blagdon, while counting at Cheddar and Blagdon on December 3 resulted in a combined total of more than 5,300 birds. From the reservoirs also are autumn records of such attractive waders as Grey Plover, Black-tailed Godwit, Wood Sandpiper, Spotted Redshank, Little Stint and Grey Phalarope. At Barrow Gurney a Water Pipit was identified in January and a Bewick's Swan in December.

Goose reports from the New Grounds show that common White-fronts reached a total of 2,500 in January and the exceptional figure of 3,900 in the second week of December. Records of special note are of a single Greylag ; five or six Greenland White-fronts ; five Lesser White-fronts ; and single specimens of Bean Goose and Barnacle. A late October count of 73 was the maximum number returned for the Pink-foot.

A notable feature of the year was the surprisingly early arrival of summer migrants. Among the earliest were a Wheatear at Lansdown on March 10, and a Chiffchaff at Long Ashton on the 11th. At Blagdon reservoir on the 16th Chiffchaffs were almost everywhere (more than 50 seen) and at least 200 Sand Martins were observed migrating over the water. By the 25th Garganey, Wryneck, Swallow and Ring Ouzel had also been reported. Such unusually early travellers encountered snow and a bitter northerly wind during the closing days of the month.

The following members have contributed :—A. E. Billett, P. F. Bird, Rev. F. L. Blathwayt, H. J. Boyd, Col. G. A. Bridge, G. C. Buxton, Miss K. M. Cary, P. J. Chadwick, Miss G. G. Clement, G. E. Clothier, R. V. Culverwell, H. H. Davis, E. E. Dunn, H. Dunnicliff, N. J. Durrant, R. G. Hamilton, B. King, F. H. Lake, H. R. H. Lance, A. C. Leach, N. W. Moore, H. W. Neal, P. J. M. Nethercott, Rev. E. W. Plowright, R. H. Poulding, W. L. Roseveare, Peter Scott, R. A. Skinner, W. R. Taylor, Rev. G. C. W. Wallis, Miss C. A. L. Wareham, H. F. Webb and M. A. Wright. Non-member contributors are M. Bratby, G. Bright, P. S. Bulson, Mrs. M. L. Butterworth, J. D. Cave, S. Chadwin, E. Cosh, S. F. Cray, C. H. Fry, R. Glanville, D. R. Hamblett, E. Hamblett, J. H. Harford, A. J. F. Holley, E. G. Holt, S. T. Johnstone, D. Lea, D. F. McKinney, Miss E. D. Overend, T. J. Owens, P. G. Perkins, S. Semple, D. M. Skinner and J. R. Tayler. Observations are followed with the appropriate initials throughout.

Unless otherwise stated the classified notes below refer only to 1952. In contrast to previous issues, and in accordance with what is likely to become a generally accepted practice, the birds are listed to conform with the Wetmore classification (beginning with Divers and ending with Passerines) as adopted in the recently published B.O.U. *Check-List of the Birds of Great Britain and Ireland.* The scientific nomenclature, however, continues to follow that of *The Handbook* (cf. Editorial Note, *British Birds*, XLVI, p. 1).

G = South Gloucestershire **S** = North Somerset

GREAT NORTHERN DIVER *Colymbus immer*

S. One seen, sometimes two, Cheddar res., various dates, Jan. 11–17 (G.G.C., K.M.C., H.H.D. *et al.*) ; single bird, same place, mid-Dec. (P.J.C., B.K.). A diver, probably Great Northern, in flight off Brean Down, Oct. 26 (P.J.C., N.W.M.).

BLACK-NECKED GREBE *Podiceps nigricollis*

S. Single bird, Barrow Gurney resrs., Jan. 19 (H.D.), and up to three, various occasions, Sept. 5–25 (G.G.C., P.J.C., B.K.). One, Blagdon, res., Sept. 7 (P.J.C.).

LEACH'S PETREL *Oceanodroma leucorrhoa*

G. and **S.** Driven by Atlantic gales, unprecedented numbers occurred, late Oct.–early Nov., in all parts of the Channel and Estuary, many being blown far and wide inland. Hundreds reported in flight, Brean Down area, Oct. 25 and succeeding days, and dead birds found strewn over Brean and Weston sands. About 250 seen in flight, Aust, on 26th, while on same date, many found alive and dead, Sharpness, and 260 or more seen flying over New Grounds sand-banks. One appeared in advance of main influx, New Grounds, Oct. 13. Reservoir records of up to six or seven flying and over 50 dead, Cheddar, and of odd specimens, Blagdon and Barrow Gurney. Single birds recovered dead in various parts of the City, and in numerous inland localities, including Alveston, Doynton and Dursley in Gloucestershire, and Chewton Mendip, Congresbury, Limpley Stoke, Stanton Drew, Temple Cloud and Wells in Somerset. One, Stoke Gifford (Glos.) on 30th, though flying strongly, made no headway against a moderate wind and was being carried rapidly eastward. A flying bird was shot, Damery (Glos.) on 31st. (For fuller details see p. 343 of this issue of the *Proceedings*).

STORM PETREL *Hydrobates pelagicus*

G. At least two among many Leach's Petrels in flight over Estuary, New Grounds, Oct. 26 (H.J.B., B.K.).

S. Two in flight with large number of Leach's Petrels, off Brean Down, Oct. 26; two dead among numerous Leach's Petrel remains, Brean sands, same date (P.J.C., N.W.M.).

FULMAR *Fulmarus glacialis*

S. Single bird off Steep Holm, May 31 (H.D.).

GANNET *Sula bassana*

S. Remains of dead bird found, Blagdon res., Jan. 12 (G.B., R.G.). Immature bird, evidently badly oiled, swimming, Ladye Bay, Clevedon, Aug. 4 (S.S. per B.K.). Immature found dead on sands, Weston-super-Mare, Aug. 10 (P.J.C., R.H.P.).

SHAG *Phalacrocorax aristotelis*

S. One, immature, Cheddar res., various dates, Jan. 11–Feb. 13 (P.J.C., B.K., W.L.R.) and Aug. 10 (B.K.).

HERON *Ardea cinerea*

S. Thirty-eight occupied nests (second highest total), Brockley Combe, Apr. 26 (P.J.C., B.K.). Twenty-three occupied nests, Uphill Grange, May 15 (W.L.R.). Banwell heronry found deserted, May 24 (W.L.R.). Young bird ringed, Brockley, May 25, recovered Tiverton, Devon, Nov. 9 (R.H.P.); another ringed, same place, June 4, recovered Chumleigh, Devon, Oct. 15 (A.E.B.).

MALLARD *Anas platyrhyncha*

G. Maximum counts on Estuary, New Grounds: 900, Jan. 28, and 1,200, Sept. 19 (H.J.B.).

S. Highest count at reservoirs: 779, Blagdon, Sept. 21 (P.J.C., B.K.). Maximum totals in coastal areas: 185, Axe Estuary, Sept. 23 (W.L.R.); 387, Yeo Estuary, Dec. 14 (P.S.B. per B.K.). Juvenile ringed, Blagdon res., 21/7/50, recovered Peenemünde, Pomerania, 19/8/51.

TEAL *Anas crecca*

S. Yeo Estuary: 500, Jan. 27 (W.L.R.); 835 counted, same place, Feb. 10 (P.S.B. per B.K.). Maximum counts at reservoirs: Barrow Gurney, 394, Feb. 10, and 252, Dec. 14 (G.E.C., P.J.C.); Blagdon, 1,450 (highest total yet), Dec. 3 (B.K.); and Cheddar, 800, Dec. 6 (B.K.). Nest with eggs, Clevedon, May 22 (H.D.).

GARGANEY *Anas querquedula*

G. One visited S.W.T. enclosures, New Grounds, Nov. 29 (S.T.J.).

S. Pair, Blagdon res., Mar. 16 (G.G.C., C.A.L.W.).

GADWALL *Anas strepera*

S. Two, Blagdon res., Jan. 13, Sept. 14, Dec. 14, and one, Oct. 12 (P.J.C., B.K.). Single bird, Cheddar res., Nov., 16, and two, Dec. 14 (P.J.C., B.K., R.H.P.).

WIGEON *Anas penelope*

G. Largest count on Estuary, New Grounds: 1,350, Jan. 28 (H.J.B.).

S. Blagdon res.: record totals of 1,300 or more, Jan. 11, 20, and 1,285, Feb. 17 (P.J.C., B.K.). Highest count in coastal areas: 300, St. George's Wharf, Jan. 24 (A.C.L.).

PINTAIL *Anas acuta*

G. Total of 109 on Estuary, New Grounds, Jan. 29 (H.J.B.). One ringed, New Grounds, 11/7/50, and recaptured and released, same place, 4/4/52, was shot, Forserum, Sweden, 25/8/52.

S. About 50, Yeo Estuary, Jan. 27 (W.L.R.). Up to nine, Blagdon res., various dates, Jan.–Feb. (P.J.C.), and up to ten, various occasions, Sept.–Dec. (G.G.C., B.K., C.A.L.W.). Six, Cheddar res., Nov. 30 (P.J.C.), and sixteen, Dec. 3 (B.K.).

SHOVELER *Spatula clypeata*

S. Count of 58, Yeo Estuary, Jan. 27 (P.S.B. per B.K.). The only noteworthy reports from the reservoirs are: 75, Blagdon, Feb., 24, and 74, Dec. 3; 29, Barrow Gurney, Nov. 30, Dec. 7; and 34, Cheddar, Dec. 14 (P.J.C., B.K.).

SCAUP *Aythya marila*

S. Single male, Blagdon res., Jan. 11 (G.C.W.W.) and on unusual date of July 20 (P.J.C.). Male, Barrow Gurney resrs., Jan. 13, Feb. 10 (P.J.C.); female or immature, same place, Mar. 23 (G.E.C.) and Sept. 16 (G.G.C.). Four females, Cheddar res., Nov. 26; one still there, Dec. 3 (B.K.).

TUFTED DUCK *Aythya fuligula*

G. Six on Estuary, New Grounds, Jan. 27, and 24, Feb. 5; single bird, same place, Sept. 19 (H.J.B.). Male, Cumberland Basin, Dec. 14 (G.G.C., R.A.S., C.A.L.W.).

S. Total of 28 on lake, Orchardleigh, nr. Frome, Jan. 27 (E.D.O. per B.K.). Maximum counts at reservoirs: 297, Blagdon, Nov., 16; 108, Barrow Gurney, Dec. 7; and 190, Cheddar, Dec. 13 (P.J.C., B.K.).

POCHARD *Aythya ferina*

G. Fifty-five on Estuary, New Grounds, Jan. 27, and 39, Feb. 5 (H.J.B.).

S. Record numbers, Blagdon and Cheddar resrs., mid-Nov. to mid-Dec. Counts of 403, Blagdon, and 1,175, Cheddar, Nov. 16; at least 2,100 (highest yet), Cheddar, Nov. 30, and 1,500, Dec. 3; 876, Blagdon, and 1,028, Cheddar, Dec. 14 (P.J.C., B.K.).

GOLDENEYE *Bucephala clangula*

S. Fifteen, Cheddar res., Jan. 27 (G.G.C., P.J.C.) and nine Nov. 30 (B.K.). Male, Barrow Gurney resrs., Feb. 10; two, females or immatures, same place, Oct. 12 (P.J.C.); 29, Blagdon res., Feb. 24, and record number of 42, Apr. 11 (P.J.C., B.K., W.L.R.).

GOOSANDER *Mergus merganser*

S. Up to five (2 ad. males), Cheddar res., various dates, Jan. 27–Mar. 2 (K.M.C., G.G.C., W.L.R. *et al.*) ; five (1 ad. male), same place, Nov. 30 (P.J.C., B.K.). Party of ten, females or immatures, at Litton res. Nov. 16, were seen by A.T. to leave in direction of Blagdon at 11.0 a.m. ; what was probably the same party was found at Blagdon res. an hour or two later (P.J.C., B.K., R.H.P.). Party of nine, females or immatures, Litton res., Dec. 28 (A.T. per R.H.P.).

SMEW *Mergus albellus*

S. One or two, Barrow Gurney resrs., Jan.–Feb. (P.J.C., A.C.L.) and up to eleven, various dates, Dec. (G.E.C., A.C.L., C.A.L.W. *et al.*). Up to half-a-dozen (including one or two ad. males), Blagdon res., various occasions, Jan.–Mar. (G.G.C., W.L.R., C.A.L.W. *et al.*), one ad. male remaining to unusually late date of Apr. 4 (G.C.W.W.). Twice noted, same place, Dec.—eight (1 ad. male) on 3rd, and nine (1 ad. male) on 14th (P.J.C., B.K.).

SHELD DUCK *Tadorna tadorna*

G. Maximum counts on Estuary, New Grounds : 156, Mar. 10 ; 112, Apr. 10 ; 130, Sept. 16 ; 117, Oct. 19 (H.J.B.).

S. Single bird, Barrow Gurney resrs., Jan. 6 (P.J.C.). Pair escorting 27 ducklings, St. George's Wharf, July 18 (A.C.L.) ; 300, Axe Estuary, Oct. 19 (P.J.C., R.H.P.). In Weston Bay, where 662 counted, Nov. 13, numbers started to rise in early Sept., but the majority departed between Nov. 28 and Dec. 5 (W.L.R.).

GREYLAG GOOSE *Anser anser*

G. Single bird, New Grounds, Oct. 26–Nov. 27 (H.J.B., B.K., P.S. *et al.*).

WHITE-FRONTED GOOSE *Anser albifrons albifrons*

G. New Grounds : 2,000–2,500, Jan. to mid-Feb. ; decrease to 1,160 by Mar. 4, followed by rapid decline to 122 on 10th. Last seen, two, Mar. 17. First autumn arrival : one, Oct. 2 ; thereafter steady increase to 184, Oct. 4, and 415 on 30th ; 860, Nov. 19, and 1,500 on 30th ; 3,100, Dec. 7, and 3,900 on 12th ; total remaining at over 3,000 to end of year (H.J.B.). Severn Wildfowl Trust reports the following Continental recoveries of birds ringed at New Grounds :—

RINGED	RECOVERED	
Feb., 1948	Hamburg, Germany	Oct., 1952
,, 1950	Vologda Prov., Russia	Apr., ,,
,, ,,	Ostfriesland, Germany	Oct., ,,
,, 1952	East Flanders, Belgium	Feb., ,,
,, ,,	Tula Prov., Russia	Apr., ,,
,, ,,	Ryazan Prov., Russia	Apr., ,,
,, ,,	Ostfriesland, Germany	Oct., ,,
,, ,,	West Flanders, Belgium	Dec., ,,

S. Eleven shot from party of 16, off Brean Down, Nov. 29 (A.J.F.H.).

GREENLAND WHITE-FRONTED GOOSE *Anser albifrons flavirostris*

G. The following, all adult, identified among birds of typical form at New Grounds : two, Jan. 22 ; one, Nov. 1–5 ; three, various dates, Nov. 18–Dec. 14 (H.J.B., P.S. *et al.*).

LESSER WHITE-FRONTED GOOSE *Anser erythropus*

G. Identified among common White-fronts, New Grounds, for eighth successive year : ad. female, Feb. 3–22 ; ad. male, Mar. 4–9 (H.J.B.) ; immature bird, Nov. 27–Dec. 24 (H.J.B., P.S.) ; single ad., Dec. 12–18 (D.L.) and another, Dec. 28–31 (H.J.B., P.S.).

BEAN GOOSE *Anser fabalis*

G. First winter bird, New Grounds, Dec. 10–31 (H.J.B. H.H.D., P.S. *et al.*).

PINK-FOOTED GOOSE *Anser brachyrhynchus*

G. New Grounds : up to four, various dates, early Jan. to early March. First autumn arrivals—three, Sept. 20, numbers increasing to 37, Oct. 1, and 60 on 5th. Highest count 73, Oct. 30, but steady decrease to less than a dozen by late Nov. Odd birds, not more than four at once, to end of year (H.J.B.).

BARNACLE GOOSE *Branta leucopsis*

G. One, immature, New Grounds, Nov. 30–Dec. 18, or later (H.J.B., B.K., P.S.).

MUTE SWAN *Cygnus olor*

S. Record count of 76, Blagdon res., July 20, Aug. 3 (P.J.C.).

BEWICK'S SWAN *Cygnus bewickii*

S. One, Dec. 25, Barrow Gurney resrs., where the species has not been noted previously (G.E.C., M.A.W.).

BUZZARD *Buteo buteo*

G. Frequently seen, Dyrham, Jan. to late May, but no conclusive evidence of breeding (F.L.B.). Four circling together nr. Tortworth, Jan. 17 (F.L.B.). Single birds, North Nibley, May 25 (H.F.W.) and Rangeworthy, Aug. 17 (J.H.H.).

S. Single birds reported from various widely separated localities, including Long Ashton (G.E.C.); Bathford (D.R.H., E.H.); Blagdon (P.J.C., R.G.H., *et al.*); Shipham and Sidcot (B.K.). Two, Blagdon, Apr. 11 (W.L.R.). Four, Bleadon, Apr. 11 (A.E.B., P.J.C.) and three, Aug. 23 (G.G.C.). One or two throughout year, Hutton, where breeding suspected but not proved (H.R.H.L.).

HEN HARRIER *Circus cyaneus*

S. Ad. female, showing heavy moult of wings and tail, Brean Down, Oct. 19 (P.J.C., R.H.P.).

HOBBY *Falco subbuteo*

G. Single birds, Little Stoke, May 9, June 17, July 1 (H.H.D.).

PEREGRINE *Falco peregrinus*

G. Single birds reported from Henleaze, Jan. 13 (A.E.B.) and North Nibley, Jan. 17, 27 (E.E.D., H.F.W.). One, stooping at Lapwings, Little Stoke, Oct. 9 (H.H.D.). Pair, New Grounds, Oct. 26 (B.K.).

S. The following reported: One, Pill, Jan. 24 (A.C.L.); one, Sand Point, Feb. 9, Nov. 12 (W.L.R.); one, Clevedon, Apr. 6 (P.J.C.); one, Steep Holm, July 9 (R.H.P.) and two, Oct. 12 (H.H.D., A.C.L.); one, Brean Down, Feb. 24, Oct. 19, 23 (G.B., P.J.C., W.L.R.), and two, June 29 (C.H.F.).

MERLIN *Falco columbarius*

G. One, New Grounds, Oct. 26, Dec. 6 (H.J.B., B.K.). One, Stinchcombe Hill, Nov. 10, 1951 (D.R.H., E.H.).

S. Single birds, Hinton Charterhouse, Mar. 2 (P.J.C., H.W.N.); St. George's Wharf, Oct. 21 (A.C.L.) and Brean Down on 26th (P.J.C., H.D., N.W.M.).

KESTREL *Falco tinnunculus*

G. Pair again bred on aperture ledge, Tyndall's Monument, North Nibley (E.E.D., H.F.W.).

QUAIL *Coturnix coturnix*

G. Calling heard, Dyrham, various occasions, June 26–July 20, and a bird flushed Aug. 25, but no direct evidence of breeding (F.L.B.). One seen in stubble-field, Aust, Aug. 17 (R.A.S.).

WATER RAIL *Rallus aquaticus*

G. One seen, almost daily, at small pond, Wick, Dec. 9–31 (D.R.H., E.H.).

S. Heard at claypits, Cheddar res., Mar. 1, Nov. 9 (B.K.).

CORNCRAKE *Crex crex*

G. Single birds in corn crops, Wotton-under-Edge, Aug. 17 (H.F.W.) ; Westerleigh on 18th ; and Yate, Sept. 14 (J.H.H.).

COOT *Fulica atra*

S. Cheddar res. : numbers little short of 2,000, several dates, Jan.–Feb. (B.K., W.L.R.).

OYSTERCATCHER *Haematopus ostralegus*

G. Heard, Oct. 26, on Estuary, New Grounds, where by no means frequent (H.H.D.).

GREY PLOVER *Squatarola squatarola*

S. One, Blagdon res., Sept. 21 ; second inland record (P.J.C., B.K.).

GOLDEN PLOVER *Pluvialis apricaria*

G. Forty, Hallen Marsh, Jan. 26 (H.D.) ; 30, Codrington, Dec. 21 (R.H.P.).

S. 200, Lansdown, Apr. 4, and large party, Nov. 24 (F.L.B.); 189, Lulsgate aerodrome, Oct. 12 (P.J.C., B.K.).

TURNSTONE *Arenaria interpres*

S. Single bird, Cheddar res., May 4 (B.K.).

JACK SNIPE *Lymnocryptes minimus*

S. One, Blagdon res., Jan. 20 (P.J.C.). Two at claypits, Cheddar res., Feb. 17, and one, 24th (P.J.C., B.K.).

WOODCOCK *Scolopax rusticola*

G. Two, Westridge Wood, Wotton-under-Edge, Jan. 18, and one, Feb. 3 (H.F.W.). One, Hanham Woods, Dec. 6 (E.W.P.).

S. Twice seen, Hutton, in Dec. (H.R.H.L.).

BLACK-TAILED GODWIT *Limosa limosa*

S. Two, Blagdon res., Aug. 2 (B.K.) ; one, same place, various occasions, Oct. 12–19 (G.C.B., H.R.H.L. *et al.*). Single bird, Barrow Gurney resrs., various dates, Sept. 22–Oct. 11 (K.M.C., R.V.C., C.A.L.W. *et al.*).

BAR-TAILED GODWIT *Limosa lapponiea*

G. One, New Grounds, Mar. 15, Sept. 12 (H.J.B.). Two, Severn Beach, Sept. 7 (H.H.D.).

GREEN SANDPIPER *Tringa ochropus*

G. One visited S.W.T. enclosures, New Grounds, May 24 (P.S.).

S. Three, Yeo Estuary, Aug. 19 (W.L.R.). Single birds, mouth of Avon, Aug. 22 (P.J.C.) and Blagdon res., Nov. 23 (G.C.B.).

WOOD SANDPIPER *Tringa glareola*

S. Single bird, Blagdon, Aug. 31—third record only for the reservoirs (P.J.C.).

COMMON SANDPIPER *Actitis hypoleucos*

S. Wintering birds again reported from the reservoirs—one, Barrow Gurney, Jan. to mid-Feb. and Oct. to late Nov. (G.G.C., C.A.L.W. *et al.*); one, Cheddar, Jan.–Feb., and two, Oct. to mid-Dec. (R.V.C., W.R.T. *et al.*). Single bird, doubtless wintering, Pill, Feb. 23 (A.C.L.).

REDSHANK *Tringa totanus*

S. Increasing as nesting species, Portbury Wharf; nine nests, with eggs, located, Apr. 25 (G.B., R.G.).

SPOTTED REDSHANK *Tringa erythropus*

S. One clearly identified, Barrow Gurney resrs., Sept. 16 (G.G.C.).

GREENSHANK *Tringa nebularia*

S. Single birds, Blagdon res., Aug. 24 (G.G.C., C.A.L.W.) and mouth of Avon, Aug. 27 (P.J.C., R.H.P.).

KNOT *Calidris canutus*

G. Twenty-five or more on mud-flats, Hallen, Sept. 21 (G.G.C., K.M.C., C.A.L.W.).

LITTLE STINT *Calidris minuta*

G. One, Severn Beach, Sept. 7 (H.H.D.); two, New Grounds, Oct. 24 (H.J.B.).

S. One, Barrow Gurney resrs., Oct. 4 (R.V.C.).

SANDERLING *Crocethia alba*

S. Thirty-six, Brean sands, Aug. 10 (P.J.C., R.H.P.).

RUFF *Philomachus pugnax*

G. Four, New Grounds, Mar. 5, 6 (H.J.B., T.J.O.).

GREY PHALAROPE *Phalaropus fulicarius*

S. One, Barrow Gurney resrs., Oct. 26–28 (G.E.C., H.H.D.). Dead bird, Cheddar res., Oct. 27 (E.C. per B.K.) ; one, same place, Oct. 29, Nov. 3 (R.V.C., W.R.T.).

GREAT BLACK-BACKED GULL *Larus marinus*

G. Sixty, an unusually large number, New Grounds, Nov. 3 (H.J.B.).

S. Bird ringed, Steep Holm, 23/6/51, recovered Finistère, France, 1/11/52.

LESSER BLACK-BACKED GULL *Larus fuscus graellsii*

S. Forty-one, Barrow Gurney resrs., Jan. 6 (P.J.C.).

SCANDINAVIAN LESSER BLACK-BACKED GULL *Larus fuscus fuscus*

S. One, viewed in good light and confidently identified, Cheddar res., Mar. 16 (B.K.).

HERRING GULL *Larus argentatus*

G. Pair bred, unsuccessfully, Avonmouth ; nest built on disused wooden jetty on Avon side of Docks and two eggs laid, but frequent disturbance caused birds to desert. Only one previous breeding record for Gloucestershire—cf. *Proc. B.N.S.*, 1942, p. 374 (R.H.P.).

S. Bird ringed, Steep Holm, July 8, recovered Devonport, Dec. 4 (R.H.P.).

GLAUCOUS GULL *Larus hyperboreus*

G. One, probably a fourth winter bird, with Great Black-backs, New Grounds, Feb. 12 (H.J.B.).

KITTIWAKE *Rissa tridactyla*

S. Single adults, Cheddar res., Aug. 10 (B.K.) ; Brean Down, Sept. 23 (W.L.R.).

BLACK TERN *Chlidonias niger*

S. Barrow Gurney resrs. : one, Apr. 8—earliest date for the district (D.M.S. and J.R.T. per A.C.L.) ; ten, May 16 (P.J.C.) ; four, Aug. 19, 20 (G.E.C.) ; and one, Oct. 15 (G.G.C.). Single birds, Cheddar res., May 4 (B.K.) ; Aug. 26 (C.A.L.W.) ; and

Blagdon res., July 6 (P.J.C.) ; Oct. 19 (B.K.). One still present, Blagdon, Oct. 26—latest date for the district (G.C.B.).

Common Tern *Sterna hirundo* Arctic Tern *Sterna macrura*

G. Single birds, New Grounds, Apr. 23, Sept. 29 (H.J.B.).

S. One, Common, Cheddar res., June 1, 2 (B.K.). Three, Barrow Gurney resrs., Aug. 19, 20 (G.E.C.). Two, Cheddar res., Aug. 24 (P.J.C.) and one, Nov. 5 (B.K.).

Turtle Dove *Streptopelia turtur*

G. Nestling found nr. Wotton-under-Edge was successfully reared by domestic birds in a local pigeon loft ; it was ringed and released, Aug. 3 (H.F.W.).

Tawny Owl *Strix aluco*

G. Leg-bone of a bird ringed as nestling, Almondsbury, 1/5/41, found, with ring, in a hollow tree, Speedwell, Bristol, 25/2/52 (A.E.B.).

Short-eared Owl *Asio flammeus*

G. One, New Grounds, Dec. 12 (H.J.B.).

Nightjar *Caprimulgus europaeus*

G. One, Dursley, May 10 (D.R.H., E.H.). Seen or heard, Westridge Wood, Wotton-under-Edge, various dates, mid-June to early Aug. (E.E.D., H.F.W.).

S. About twelve pairs, Forestry Commission clearings, Leigh Woods, but breeding population noticeably less than in previous year (R.V.C.).

Kingfisher *Alcedo atthis*

G. and **S.** Continues to occur in most suitable haunts. Noted during year on rivers Avon, Chew, Frome, Hen, Little Avon, Trym and Yeo (A.C.L., P.J.M.N., E.W.P. *et el.*). Nesting reported, Tickenham, for third successive season (A.E.B.).

Hoopoe *Upupa epops*

S. One seen for about half an hour on lawn, Norton Lane, Whitchurch, Apr. 26 (S.F.C. per H.J.B.).

Lesser Spotted Woodpecker *Dryobates minor*

G. One, Hanham Woods, Feb. 23 (E.W.P.). Two, Wortley, Wotton-under-Edge, Apr. 13 (H.F.W.). One, Dyrham, May 29 (F.L.B.).

S. One, Long Ashton, Sept. 14 (M.A.W.).

WRYNECK *Jynx torquilla*

G. One, repeatedly calling, early morning, Clifton, Mar. 19 (J.D.C. per W.R.T.).

WOODLARK *Lullula arborea*

G. Breeding season records from Dursley, where at least two pairs present, April–May, and nest with eggs located May 4 (D.R.H., E.H.); also from N. Nibley where adult seen carrying food, June 9 (H.F.W.), and parties of up to eight, including juveniles, several dates, late July (D.R.H., E.H.).

S. One, Long Ashton, Feb. 28 (G.E.C.) and one migrating south, Brean Down, Oct. 26 (P.J.C., N.W.M.). Breeding season records of single birds, Bleadon, Apr. 11, May 22 (A.E.B., H.R.H.L.); Crook Peak, Apr. 11 (A.E.B., P.J.C.); and two, Hutton, Apr. 25 (H.R.H.L.).

RAVEN *Corvus corax*

G. Single birds, Damery, Apr. 13 (H.D.); Durdham Down, June 29 (C.A.L.W.); New Grounds, Sept. 29, 30, Oct. 31 (H.J.B.).

S. Bred successfully, Brean Down (G.B., R.H.P.) and probably Sand Point, where three young seen in flight, June 6 (W.L.R.). Two, Long Ashton, Jan. 22 (G.E.C.); Sidcot, June 15 (B.K.); Steep Holm, July 8, 9 (R.H.P.), Oct. 12 (A.C.L., R.H.P.); and one, Blackdown, July 19 (G.G.C.).

HOODED CROW *Corvus cornix*

G. One, evidently adult, Hambrook, Nov. 11 (R.H.P.).

DIPPER *Cinclus cinclus*

S. Reported only from R. Chew, Publow, where one seen Oct. 11, and one, perhaps same, on 18th (G.C.B.).

FIELDFARE *Turdus pilaris* REDWING *Turdus musicus*

S. Large combined roost located in fir plantation, Rowberrow, Mendip; well over 6,000 counted flying in at dusk, Dec. 7, 14 (P.J.C., B.K.).

RING OUZEL *Turdus torquatus*

G. Single males, Little Stoke, Mar. 25, Apr. 20 (H.H.D.). Pair, Hollowcombe, nr. Dursley, Apr. 8–15, 1951 (D.R.H., E.H.).

S. Male, top of Cheddar Gorge, Sept. 21 (N.J.D.).

STONECHAT *Saxicola torquata*

S. Two or three pairs, Sand Point, Apr. 11, and a pair, Crook Peak, same date (A.E.B., P.J.C.). Nest with eggs, Brean Down, Apr. 19 (G.B., R.G.), and a pair with three young, May 29 (W.L.R.); at least three pairs, same place, June 2 (P.J.C., R.H.P.).

REDSTART *Phoenicurus phoenicurus*

G. Nest, with young, in wall of building, Aust, June 14 (H.D.).

BLACK REDSTART *Phoenicurus ochrurus*

G. Adult male, Aust Cliff, Feb. 2 (H.J.B., D.F.McK.).

S. Three, females or immatures, Brean Down, Feb. 10, and one on 27th (E.G.H.); ad male, same place, Oct. 26 (P.J.C.) and a female or immature, Dec. 28 (E.G.H.). Single females, or immatures, Sand Point, Nov. 12 (W.L.R.) and two, Dec. 7 (M.L.B.). Female or immature, Clevedon, Dec. 26 (G.C.W.W.).

NIGHTINGALE *Luscinia megarhyncha*

G. At least four singing males, Codrington, May 11; nest with eggs, same place, May 16 (R.H.P.).

ROBIN *Erithacus rubecula*

G. Pair nested in semi-automatic, brush-making machine in centre of one of the largest machine-shops, Kleen-e-ze factory, Hanham, Bristol. Full clutch of six hatched, May 29; four young successfully reared (cf. *Bird Notes*, XXV, p. 133).

Grasshopper Warbler *Locustella naevia*

G. Nest with eggs, Wotton-under-Edge, June 23 (H.F.W.).

BLACKCAP. *Sylvia atricapilla*

S. Wintering female found dead in garden, Easton-in-Gordano, Jan. 27 (P.G.P. per P.F.B.).

WOOD WARBLER *Phylloscopus sibilatrix*

G. Nests regularly in fair numbers, Dursley area (D.R.H., E.H.).

GOLDCREST *Regulus regulus*

S. At least one, Steep Holm, July 8; second record for the island (R.H.P.).

PIED FLYCATCHER *Muscicapa hypoleuca*

G. One, a male, Coombe Dingle, Apr. 13 (H.W.N.); two males, same place, on 21st (A.C.L.). Single male, Sea Mills, Apr. 20 (H.W.N.). Female, Dursley, July 25 (D.R.H., E.H.).

S. Two males (seen by ranger) Leigh Woods, Apr. 10 and a single male on 22nd (P.J.C.).

ROCK PIPIT *Anthus spinoletta petrosus*

S. Single birds, presumably of this form, Cheddar res., Sept. 28, and Blagdon res., Oct. 12 (P.J.C., B.K.).

WATER PIPIT *Anthus spinoletta spinoletta*

S. One, Barrow Gurney resrs., Jan. 6 ; identified by P.J.C., who has supplied full and conclusive details.

BLUE-HEADED WAGTAIL *Motacilla flava flava*

G. Male, with large number of *M. f. flavissima*, clearly identified at only a few yards range, New Grounds, Apr. 12 (B.K.). Identification confirmed by M.B. and P.S., who saw the bird about half-an-hour later. First authentic record for Gloucestershire side of the district.

GREAT GREY SHRIKE *Lanius excubitor*

S. One, identified as a male, on concrete sea-wall, Clevedon, Oct. 12 ; also observed hunting over adjoining rough land, and at one stage seen to hover, Kestrel fashion, two feet above ground. For instances of similar behaviour see *Brit. Birds*, XLV, pp. 30, 410 (S.C.).

RED-BACKED SHRIKE *Lanius collurio*

S. Pair bred successfully, Ashton Gate area (A.E.B., P.J.C.). Pair with two fledged young, Shute Shelve, nr. Axbridge, July 13–19 (C.H.F.).

STARLING *Sturnus vulgaris*

G. Enormous numbers roosting, Oct–Dec., in small thorn spinney about one mile west of Iron Acton. Site little more than a mile north-east of the 1948–49 Winterbourne roost (cf. *Proc.* B.N.S., 1948, p. 394 ; 1949, p. 27) (H.H.D., R.H.P.).

HAWFINCH *Coccothraustes coccothraustes*

G. One, Dodington Park, June 1 (R.H.P.).

S. One, Brockley Combe, May 25 (R.H.P.).

LESSER REDPOLL *Carduelis flammea cabaret*

G. Four, Westridge Wood, Wotton-under-Edge, Nov. 30 (E.E.D.).

SCARLET GROSBEAK *Carpodacus erythrinus*

S. One, female or immature, with small party of Chaffinches and Yellow Buntings, Cheddar res., Oct. 5. The bird, under intermittent observation for about twenty minutes, was feeding from a chaff heap below reservoir embankment and was also seen on adjoining wire fence. Slightly smaller than its companions, it attracted attention by its generally dumpy appearance, rounded head (sunk well into shoulders) and strikingly stout, conical bill. Among other characters noted were the brown coloration of head and mantle; double whitish-buff wing bar; uniformly pale-greenish back and rump; and boldly streaked breast and flanks. First record for County of Somerset (cf. *Brit. Birds*, XLVI, p. 221) (B.K.).

CHAFFINCH *Fringilla coelebs*

S. Bird ringed, Long Ashton, Jan. 26, recovered southern Sweden, Apr. 23 (G.E.C.).

BRAMBLING *Fringilla montifringilla*

S. About 30, Norton Hawkfield, Jan. 26, Feb. 2, 9 (G.C.B.). At least 60, Hinton Charterhouse, Feb. 9 (B.K.) and *c.* 100, Mar. 2 (A.E.B., P.J.C., R.H.P.).

CORN BUNTING *Emberiza calandra*

G. Probably nests nr. Dursley, where singing birds seen regularly (D.R.H., E.H.). Thirteen singing birds, Marshfield area, Apr. 14 (P.J.C.). Two males, Leighterton, Apr. 30 (H.F.W.). Single males, Wick, July 10 (D.R.H., E.H.) and Downend, July 18 (R.H.P.).

CIRL BUNTING *Emberiza cirlus*

G. Single males, Durdham Down, June 29 (C.A.L.W.) and July 13 (A.C.L.).

S. Male, Hutton, Mar. 4 (W.L.R.), May 30 (H.R.H.L.). Pair, Tickenham, May 4; six, Cheddar res., Sept. 6 (P.J.C.).

TREE SPARROW *Passer montanus*

G. Odd pairs found breeding, Downend (P.J.C., R.H.P.) and Little Stoke (H.H.D.). Birds reported outside nesting season from Aust, Frenchay, Iron Acton, Slimbridge and Wotton-under-Edge (H.D., W.R.T., H.F.W. *et al.*).

S. Bred, Saltford area, where pair with fledged young seen, May 31 (B.K.).

LEPIDOPTERA NOTES
BRISTOL DISTRICT, 1952

By C. S. H. Blathwayt, M.A., F.R.E.S.,
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(*Received, Jan. 15, 1953. Read in title to Council, Feb. 19, 1953.*)

UNTIL the end of March the season was on the early side. It was, however, retarded by cold weather at the end of March and beginning of April. The second half of April was unusually warm, and after a wet beginning May produced very hot weather. June and July were on the whole fine and warm, but August and September very wet and cold for the time of year, apart from a few fine days. October was a better month so far as weather was concerned, but November and December quite exceptionally cold. Weather, of course, plays a very important part in the abundance or scarcity of Lepidoptera and the Spring and early Summer were very encouraging but the late Summer and Autumn, as last year, very disappointing.

I am most grateful to Messrs. C. L. Bell (C.L.B.) and H. S. Damsell (H.S.D.) for sending me their records, some of which are included below with a selection from my own records (no initials).

Vanessa cardui Linn. (Painted Lady). Plentiful in the Spring ; large immigration from Continent (C.L.B.).

Limenitis camilla Linn. (*sibylla* Linn.) (White Admiral). Larvae taken in Glos. May (C.L.B.)'

Lampides boeticus Linn. (Long-tailed Blue). One female taken in Bloomfield Road, Brislington, in very poor condition, 20.7.52. (C.L.B.).

Mimas tiliae Linn. (Lime Hawk). Early emergence and pairing. First imago emerged 12.4.52. First pairing 17.4.52. First larvae hatched 6.5.52 (C.L.B.).

Herse convolvuli Linn. (Convolvulus Hawk). One male taken in Shirehampton, 3.9.52, in poor condition (C.L.B.).

Macroglossum stellatarum Linn. (Humming-bird Hawk). One taken in Horfield 5.9.52. Very scarce this year (C.L.B.).

Cerura vinula Linn. (Puss). Common Weston at light May–June.

Stauropus fagi Linn. (Lobster Prominent). Several Weston at light June–July.

Drymonia trimacula Esp. (Light Marbled-brown). Several North Somerset at light May 24.

D. ruficornis Hufn. (*chaonia* Hubn.) (Lunar Marbled-brown). Common Weston at light April and early May.

Pheosia tremula Clerck (Greater Swallow Prominent). Several Weston at light May and Aug. Bristol late April (H.S.D.).

P. gnoma Fabr. (*dictaeoides* Esp.) (Lesser Swallow Prominent). Several Weston at light May and Aug. Bristol late April (H.S.D.).

Notodonta dromedarius Linn. (Iron Prominent). Bristol 18 April at light (H.S.D.). Weston, May and June.

N. anceps Goeze (*trepida* Esp.) (Great Prominent). North Somerset at light, May 24.

Tethea ocularis Linn. (*octogesima* Hubn) (Figure of Eighty). Several, Bristol Mid-June at light (H.S.D.), also Weston.

Achlya flavicornis Linn. (Yellow-horned Lutestring). Several Weston, late March and early April at light.

Polyploca ridens Fabr. (Frosted Green Lutestring). Several, Weston, late April and early May at light.

Drepana binaria Hufn. (Oak Hook-tip). Several, May and July, Weston at light.

D. cultraria Fabr. Barred Hook-tip). Late July, Bristol at light (H.S.D.).

Pseudoips bicolorana Fuessl. (*quercana* Schiff.) (Scarce Silver-lines). Late July, Weston at light.

Bena prasinana Linn. (Green Silver-lines). Fairly common, Weston at light, May and June. Bristol, 14 June (H.S.D.).

Cycnia mendica Clerck (Muslin Ermine). Males common at light. Weston, April 26 to early June. Ditto Bristol (H.S.D.).

Eilema sororcula Hufn. (Orange Footman). Common at light Weston in May.

Apatele leporina Linn. (Miller). 11 June, Bristol at light (H.S.D.).

A. alni Linn. (Alder Dagger). Two at Weston at light, May 21 and 22.

Craniophora ligustri Fabr. (Crown). Common at light, Weston, June and July.

Amathes sexstrigata Haw. (*umbrosa* Hubn.) (Six-striped Rustic). Common at flowers, North Somerset, Aug.

Lampra fimbriata Schreber (*fimbria* Linn.) (Broad-bordered Yellow-underwing). Several, Weston at light, July to Sept. One at Bristol (H.S.D.).

Hadena w-latinum Borkh, (*genistae* Borkh.) (Light Brocade). Common at light, Weston in May. Bristol, 31 May to 11 June (H.S.D.).

H. suasa Schiff. (*dissimilis* Knoch) (Dog's-tooth). One at light, Weston in late July.

H. bombycina Hufn. (*glauca* Hubn.) (Glaucous Shears). Three at light, Weston, May 23, 24 and 26.

H. lepida Esp. (*carpophaga* Borkh.) (Tawny Shears). Weston at light in May.

Eumichtis lichenea Hubn. (Feathered Ranuncule). Common at light, Weston, Sept.

Thalpophila matura Hufn. (Straw Underwing). 2 July, Bristol (H.S.D.). Weston, late July and Aug.

Aporophyla nigra Haw. (Black Rustic). Common at Weston at light Sept. to Oct. and at Bristol in Oct. (H.S.D.).

Antitype flavicincta Fabr. (Large Ranuncule). Common at Weston at light Sept. to Oct. 5 Oct. Bristol (H.S.D.).

Griposia aprilina Linn. (Common Merveille-du-jour). Several at Weston at Ivy and light, Oct.

Brachionycha sphinx Hufn. (Common Sprawler). At light, Bristol, 9 Nov. (H.S.D.).

Nonagria sparganii Esp. (Webb's Wainscot). North Somerset coast, Aug.

Leucania straminea Treits (Southern Wainscot). Abundant North Somerset coast late June early July.

L. pudorina Schiff. (*impudens* Hubn.) (Striped Wainscot). Weston at light, late June.

L. littoralis Curt. (Shore Wainscot). North Somerset coast early July.

Stilbia anomala Haw. (Anomalous Wainscot). At light, Weston, Aug. 30.

Laphygma exigua. Hubn. (Small Mottled Willow). One at Bristol at light, March 8 (H.S.D.).

Panolis flammea Schiff. (*piniperda* Panz.) (Pine Beau). Several at light, Weston, late April and early May.

Orthosia populeti Treits. (Lead-coloured Drab). Several at light, Clevedon, early April.

O. gracilis Fabr. (Powdered Quaker). At light, Weston and Bristol (H.S.D.), in April.

Atethmia xerampelina Hubn. (Centre-barred Sallow). At light Weston, early Sept.

Anchoscelis litura Linn. (Brown-spot Chestnut). One at light, Bristol, 19 Oct. (H.S.D.).

Tiliacea citrago Linn. (Orange Sallow). Weston at light, North Somerset at Ivy, Sept. to Oct.

T. aurago Fabr. (Barred Sallow). North Somerset at Ivy, Oct. Bristol, 5 Oct. (H.S.D.).

Dasycampa rubiginea Fabr. (Dotted Chestnut). One in Bristol at light, 26 April (H.S.D.).

Lithophane socia Rott. (Pale Pinion). Common at Ivy, Weston, Oct. At light 20 March, Bristol (H.S.D.).

Cucullia lychnitis Ramb. (Striped Lychnis Shark). One at light, Weston, May 19.

C. chamomillae Schiff. (Chamomile Shark). Two at light, Weston, in May.

Heliothis peltigera Schiff. (Dark Bordered Straw). One at light, Bristol, in June (H.S.D.).

Polychrisia moneta Fabr. (Silver Eight). Weston at light, July. Bristol, 20 July (H.S.D.).

Plusia festucae Linn. (Gold Spot). Common at Shapwick in Aug.

Scopula imitaria Hubn. (Small Blood-veined Wave). Two at light, Bristol, 14 April and 6 July (H.S.D.).

Chesias rufata Fabr. (Broom-tip Chevron). One at light, Weston, May 23.

Orthonama lignata Hubn. (*vittata* Borkh) (Oblique Carpet). Common at Shapwick in Aug.

Discoloxia blomeri Curt. (Blomer's Rivulet). Fairly common at light at Weston, in June.

Pelurga comitata Linn. (Dark Spinach). Two at Bristol on 20 July and 10 Aug. (H.S.D.).

Ellopia fasciaria Linn. (*prosapiaria* Linn.) (Barred Red). Several at Weston at light in July.

Deuteronomos erosaria Borkh (September Thorn). July-Aug., Bristol (H.S.D.). Aug. to Sept., Weston at light.

Selenia tetralunaria Hufn. (Purple Thorn). April and July at light, Weston. 26 April, Bristol (H.S.D.).

Lycia hirtaria Clerck (London Brindled-beauty). 12 April at light, Bristol (H.S.D.). Weston, 18 April. Shapwick 26 April.

Zeuzera pyrina Linn. (Wood Leopard). Several at light, Weston, in July.

REVERSED FAULTING IN THE GREAT QUARRY, AVON GORGE

By I. S. Loupekine, B.Sc., Ph.D., F.G.S.

(*Received, and read in title to Council, Feb. 19, 1953.*)

Introduction

APART from references to the Observatory Hill system of thrusts*, there appears to have been little systematic work carried out on the structural features of the Avon Gorge rocks. Since the locality served as the type section in the stratigraphical subdivision of the Carboniferous Limestone Series by Vaughan (1905, 1906), a detailed study of the structures should be made to bring to light imperfections in the succession.

This note describes the reversed fault and associated phenomena which occur in the northern half of the Great Quarry, north bank of the Avon, and it draws attention to the resulting repetition of a part of the sequence in the S Zone.

The writer is indebted to Dr. Stanley Smith for reading and criticising the manuscript and to Mr. E. W. Seavill for help in the preparation of Plate 3; he has benefited from discussions with Mr. G. A. Kellaway, who has recorded (1952) faulting and folding phenomena from the Northern Storm Water Interceptor Tunnel under Clifton Down which may be connected with the faulting described in this paper.

Historical Account

Early records of disturbance in the Great Quarry were made by Stoddart, who stated (1869, p. 79):

> "A most remarkable example of the effect of pressure may be observed in the lower part of the Great Quarry. . . . Some of the bottom beds have given way, while the upper ones have been actually forced in by the superincumbent strata";

and (1875, p. 325):

> "At the western end is a very singular fracture of the beds by subsidence. During the progress of deposition, a portion has evidently been washed away, letting the superincumbent roof of five or six beds fall in; this was evidently not a recent occurrence, because the subsequent thickness of some 200 feet was afterwards regular, and shows no sign of disturbance."

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* Variously known as the Clifton Fault, Great Fault, Observatory Hill Fault: see Stoddart, 1869, 1875; Lloyd Morgan, 1885a, 1885b, 1901; Vaughan, 1905, 1906; Reynolds, 1912, 1918, 1920, 1924, 1929; Vaughan and Reynolds, 1936.

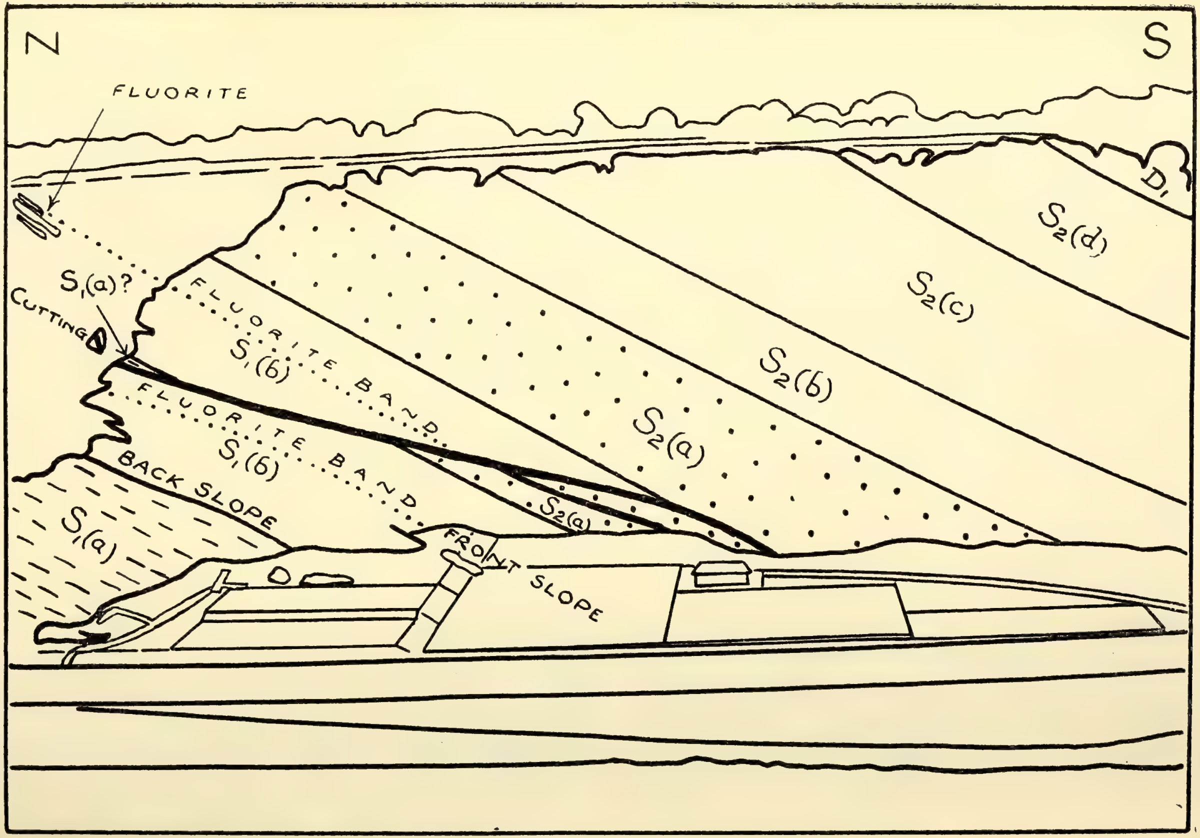
N
S
FLUORITE
D_1
$S_2(d)$
$S_2(c)$
$S_2(b)$
$S_2(a)$
$S_1(a)$?
CUTTING
FLUORITE BAND
$S_1(b)$
FLUORITE BAND
$S_1(b)$
$S_2(a)$
BACK SLOPE
$S_1(a)$
FRONT SLOPE
D

FIG. 1. MAIN REVERSED FAULT IN THE GREAT QUARRY
(cf. Plate 6, Vaughan & Reynolds, 1936).

Stoddart's allusions are obscure and no elucidation can be gained from his manuscript, " The Clifton Section ", catalogued in the library of the Bristol Naturalists' Society.

Rendle Short (1903, p. 65) alluded to the shear-planes of the Great Quarry when he described structural features in the Gully.

The first clear recognition of the main disturbance was made by Reynolds (1921b, p. 36) who stated that a " small thrust fault is seen rather high up at the northern end of the Great Quarry", and he referred the structure to a case of " reversed or overthrust faulting " (Reynolds, 1924, p. 32). Although a thrust-line is marked on Plate 13 of Reynolds' lithology paper (1921a), the position appears to be only an approximate one. In a later illustration of the Great Quarry (Plate 6, Vaughan & Reynolds, 1936) the thrust-line is not marked and the S_1(b) and S_2(a) divisions are shown to succeed each other without break. Reynolds' statement in the text (p. 59) that the " upper part of the precipitous side of the quarry overlooking the ' back slope ' is traversed by a small overthrust fault ", confirms the impression that he attributed no importance to it and did not believe the fault to extend to the bottom of the quarry.

Reynolds gave no indication of direction of thrust of the Great Quarry fault. He recorded faulting in Press's Quarry and Black Rock Quarry (Reynolds, 1921a, 1921b, 1924) and suggested (Vaughan & Reynolds, 1936, p. 61) that " these overthrusts all come from the south . . . ", originating from the same set of movements which led to the production of the Failand–Westbury anticline and major thrusts such as the Observatory Hill set (Moore & Trueman, 1939).

DESCRIPTION OF THE FAULTING

The main fault can be seen to extend from the top of the quarry at its northern end to nearly the bottom of the middle face where it appears to divide and pass into a mass of contorted and sheared strata (Fig. 1). On the wooded slopes immediately to the north of the quarry, a small cutting exposes the fault-zone with several truncated slices of veined, pink limestone (Plate 3, Fig. 1).

The fault-junction is curviplanar and is most obvious at the top of the quarry owing to discordant dips on both sides of the fault. The fault cuts obliquely across the strata at a low angle, reaching successively higher horizons when traced southward ; the hade is 40°–55° to the east and the hanging-wall often projects, revealing slickensides directed approximately to the north-east (Plate 3, Fig. 2).

The fault may be more properly regarded as a zone in which individual slices have been thrust one over another. The limestones in the fault-zone are much brecciated and reddened by iron-oxide staining, and they show extensive stylolite formation and veining, leading to the deposition of calcite, fluorite, bitumen and pyrite.

The main fault is associated with minor reversed faults which hade 40° to the north-west, minor overthrusts from the south-east and extensive north-south shearing. Bedding-plane veining is a common feature and is probably developed in connection with minor bedding-plane faulting since bedding slickensides are common, directed to the north and to the north-east and east.

REPETITION OF THE STRATA

As can be seen from Fig. 1, the effect of the faulting is to repeat the strata. Probably the uppermost portion of the S_1(a), the whole of the S_1(b) and most of the S_2(a) divisions are duplicated. The repetition is proved in Table I which contains the record of the measured succession across a selected point of the fault and a comparison with the corresponding thicknesses given by Reynolds (1921a). The beds numbered 22 to 40 (p. 340) are identical with those numbered 2 to 20 (p. 341) occurring above and below the fault respectively. The repeated strata measure about 50 feet in thickness and include such well-marked horizons as the Trilobite Bed, Fluorite Band and certain *Seminula*-pisolite Bands. The upper level of the Trilobite Bed is better exposed than the lower and has yielded several specimens of the heads of *Phillipsia.*

Reynolds (1921a) has given the thickness of the S_2(a) division to be 124 feet, of which 100 feet comprise the " massive dolomitized limestone with abundant *Lithostrotion martini* associated with white partly-dolomitized calcite-mudstone and a *Seminula*-pisolite band ". New measurements of this 100-foot formation give only 50 feet, and the difference is due to repetition by faulting. The figure of 124 feet for the S_2(a) division should therefore be revised to 74 feet. This was confirmed by measurements carried out on the opposite bank.

FLUORITE BAND AS A MARKER OF HORIZON

Repetition by faulting was suspected as a result of detailed work on fluorite in relationship to levels of pronounced dolomitisation. It was soon evident that the two main fluorite bands which were detected, though separated, belong to the same stratigraphical horizon. The general characteristics of the two bands are similar and the distribution of fluorite in the geodes of the upper level compares closely with that described for the lower level (Loupekine, 1951).

Samples of limestone were collected vertically at one-inch intervals from both levels and sectioned, and the microscopic characters of corresponding thin-sections were compared, proving beyond doubt that the two levels form part of the same sedimentary rhythm.

The thin-sections have thrown more light on the occurrence and distribution of brown fluorite. The brown fluorite is concentrated at a level about one foot below the blue-fluorite-bearing band. The rock is a compact, brown, dolomitised limestone in which there are only occasional calcite infillings where the brown fluorite may occur as crystals and grains reaching a size of 1.5 x 1 cm. The fluorite is best seen in thin-section and is found fairly consistently for 18 inches below the large bedding-stylolite, but more particularly between 6 and 10 inches below it. The brown fluorite occurs both in single crystals and grains in the matrix and in dolomite-calcite geodes. The characters of both the lower and upper levels are closely comparable (Fig. 2, A & B).

Use was made of the fluorite band in following the bed northward. Search along the edge of the Downs (Fig. 1) revealed the presence of a thin band of brown limestone which, on sectioning, proved to be rich in brown fluorite indistinguishable from that of the Great Quarry levels (Fig. 2, C). Subsequent detailed measurements provided an identical succession over almost the entire S_1(b) division.

The value of the fluorite band as a marker of horizon is evident, but it remains to be seen if it could be utilised over a wider area. It is hoped to determine the limits of its occurrence by following its eastern and western extensions.

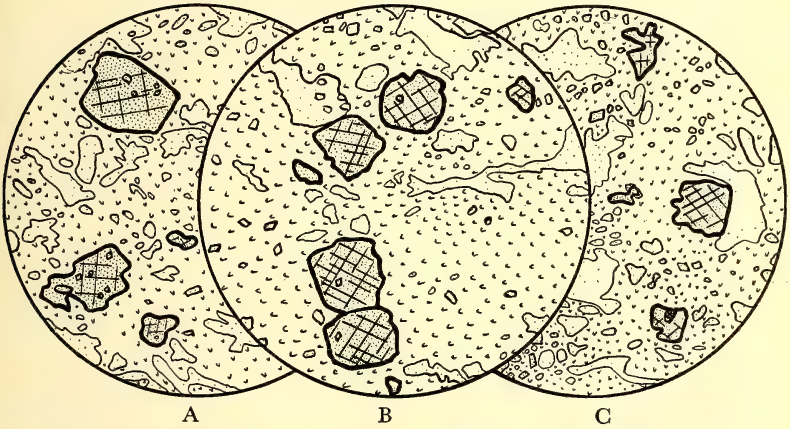

FIG. 2. FLUORITE-BEARING DOLOMITIZED LIMESTONES, BROWN-FLUORITE-BEARING BAND. × 40.

A. Level below the fault, Great Quarry.
B. Level above the fault, Great Quarry.
C. Edge of Clifton Down, above Great Quarry.

Table I.—Geological Succession: Composition of the S_1(b) subdivision.*

	S_2(a)	Thickness.		Total thicknesses.‡		
		ft.	ins.	ft.	ins.	
41.	Dolomitised limestones with *Lithostrotion* colonies; band of *Seminula*-pisolite near top	10	11	16 (16	0 0)	
40.	Dark-brown-weathering, dolomitic limestone underlain by pale-brown-weathering calcite-mudstone, thinly laminated at base	3	4			
39.	Dolomitised, crinoidal limestone with corals	1	9			
38.	Laminated limestone intercalated between two shale-layers	0	8	18 (18	5 0)	
37.	Granular, dolomitised limestone with corals, *Productus*, *Seminula*	3	6			
36.	Massive, dolomitised limestone with corals	2	11			
35.	Dolomitised limestone	0	9			
34.	Dolomitised limestone with *Lithostrotion*, *Caninia*, *Syringopora*, brachiopods	2	5			
33.	Crinoidal limestone with *Lithostrotion*, *Caninia*, *Syringopora*, *Productus*	2	2			
32.	Dolomitised limestone with central, richly fossiliferous band with *Lithostrotion* colonies, *Caninia*, *Productus*, *Syringopora*	2	11			
31.	Dolomitised, crinoidal limestone with *Lithostrotion*, *Productus*	3	1			
30.	Ochreous-weathering, blue-fluorite-bearing, geodal, dolomitised limestone, with large bedding-stylolite near the base; passing downward into brown-fluorite-bearing, dolomitised limestones and calcite-mudstones; and finally into calcite-mudstone	4	6	6 (6	8 0)	Repeated (thickness: 25 ft. 0 ins.)
29.	Calcite-mudstone with upper junction smooth and undulose	0	6			
28.	Calcite-mudstone with *Seminula* near top	1	8			
27.	Limestone intercalated between two shale-bands which yield *Productus* and spines, Bryozoa, trilobites	0	11	4 (3	1 0)	
26.	Calcite-mudstone with abundant *Seminula* in upper part	2	0			
25.	Dolomitised limestone with *Productus*	1	2			
24.	Calcite-mudstones with *Seminula* and *Productus* abundant in upper part	6	9	14 (14	3 0)	
23.	Alternating layers of shale and thin limestones with *Productus*, Bryozoa	1	6			
22.	Fine-grained, dolomitised, crinoidal limestone with *Productus*	6	0			
21.	Thrust slices of pink limestones, much veined, brecciated, with abundant stylolites	2	6	2	6	R.F.

* The demarcations in Table I are taken at the more prominent shale-partings, which are usually from one to two inches in thickness.

‡ The figures in parentheses are those of Reynolds (1921a).

		Thickness. ft. ins.	Total thicknesses. ft. ins.	
20.	Ochreous-brown-weathering, dolomitic limestone with *Lithostrotion*, *Syringopora*; underlain by pale-brown-weathering, calcite-mudstone with *Seminula*, thinly laminated at base	3 4	5 1	Repeated (thickness: 23 ft. 10 ins.)
19.	Dolomitised, crinoidal limestone with *Seminula*, *Lithostrotion*	1 9		
18.	Limestone intercalated between two shale-layers	0 8	18 9 (18 0)	
17.	Dolomitised, crinoidal limestone with bands of *Lithostrotion*, *Seminula*, *Productus*	3 6		
16.	Massive, crinoidal limestone with corals	2 10		
15.	Dolomitised limestone	0 8		
14.	Dolomitised limestone with *Lithostrotion*, *Syringopora*	2 8		
13.	Dolomitised limestone with *Lithostrotion*, *Caninia*, *Productus*	2 2		
12.	Dolomitised limestone with central band rich in *Lithostrotion* colonies, *Caninia*, *Seminula*, *Productus* ..	2 11		
11.	Dolomitised limestone with *Lithostrotion*, *Caninia*	3 4		
10.	Ochreous-weathering, blue-fluorite-bearing, geodal, dolomitised limestone with crinoidal limestone in upper part and large bedding-stylolite near base; underlain by brown-fluorite-bearing, dolomitised limestone and calcite-mudstones; and passing downward into calcite-mudstone	4 7	6 9 (6 0)	
9.	Calcite-mudstone with smooth, undulose upper junction	0 6		
8.	Calcite-mudstone with *Seminula*	1 8		
7.	Calcite-mudstone intercalated between shale-bands which yield *Productus* and spines, Bryozoa, *Seminula*, trilobites: Trilobite Bed	0 10	4 2 (3 0)	
6.	Calcite-mudstone with abundant *Seminula*, *Productus*	2 1		
5.	Dolomitised, crinoidal limestone with *Productus* ..	1 3		
4.	Calcite-mudstones with partings and abundant *Seminula*: the upper junction constitutes the 'front slope'	6 1	14 0 (14 0)	
3.	Limestone with *Productus*, *Syringopora*, alternating with shale-laminae	1 4		
2.	Fine-grained, dolomitised, crinoidal limestone with *Productus*	6 7		
1.	Layers of dolomitised limestones with *Productus*, *Lithostrotion*, *Syringopora* separated by bands of thin limestones alternating with shale-laminae ..	10 10	10 10 (11 0)	

$S_1(a)$

The present 'back slope' is about 6 feet below.

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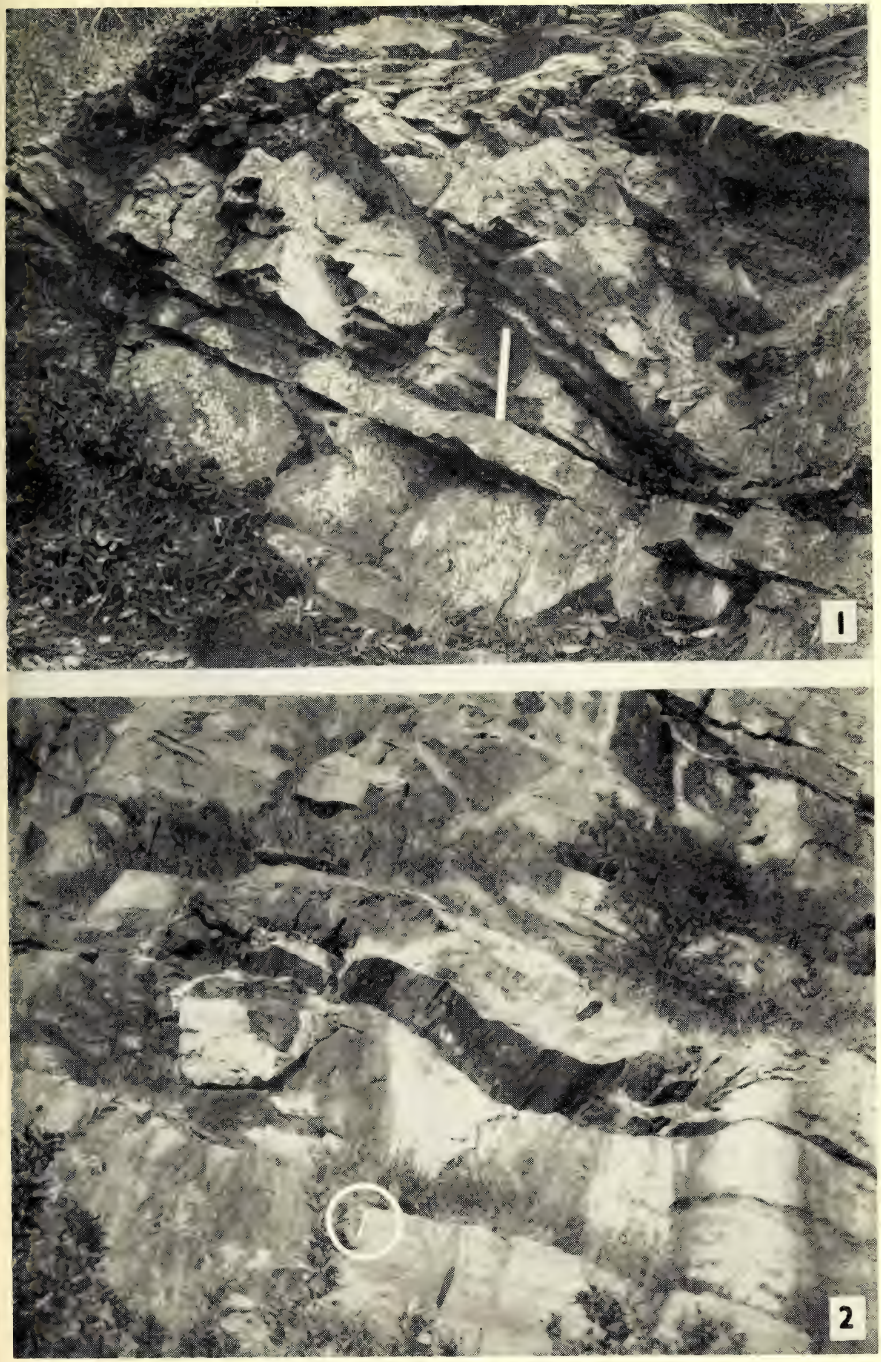
EXPLANATION OF PLATE 3

Fig. 1. Cutting on wooded slope, north of Great Quarry, Avon Gorge, exposing the fault. The upper end of the one-foot scale marks the position of the fault ; the lower end shows a bedding-plane.

—— 2. View of the main reversed fault, Great Quarry, Avon Gorge, showing slickensides on the under-surface of the projecting thrust-mass and division of the fault into a lenticular zone (one-foot scale circled).



Reversed faulting in the Great Quarry, Avon Gorge

Photo : I.S.L.] [*To face p.* 342

LEACH'S PETRELS IN BRITAIN IN THE AUTUMN OF 1952

BY HUGH BOYD

(*Read in title to Council, Feb. 19, 1953. Received for publication, March 6, 1953.*)

LEACH'S Petrel (*Oceanodroma leucorhoa*) is an oceanic bird breeding in the boreal zone of the Atlantic and the Pacific. The Atlantic breeding stations are on islands off the coast of Maine, U.S.A., in southern Labrador, the Westmann Islands (south of Iceland), the Faeroes and four or five islands in the Outer Hebrides. In winter the Atlantic population is dispersed over the southern North Atlantic, to a few degrees south of the Equator. Away from its breeding places the species is not often seen in Britain, though some birds are reported every year, principally off the western coasts and during the months of September to November. The appearance of any numbers of the birds on the coasts usually coincides with strong, westerly winds and records of odd individuals in many inland counties during the last half-century have also been associated with stormy weather.

The autumn of 1952 was remarkable for the exceptionally large numbers of Leach's Petrels seen in Britain, particularly during the last week of October and the first week of November. At this time birds were found, alive or dead, in all parts of the British Isles, the Channel Islands, France and Belgium and one even reached Switzerland. A comprehensive report on the British records will appear in *British Birds* but, as the Bristol district was one of the areas in which the birds were especially numerous, this summary of the event places more emphasis on local records than would be desirable in a national report.

It will be convenient to disregard the boundaries laid down for the Bristol District and treat as a whole the area of the Bristol Channel and the Severn Estuary with the contiguous counties, taking the western limit of the area to be a line drawn from Tenby, Pembrokeshire, south through Lundy to Hartland Point in Devon and regarding Gloucester as the eastern end of the Severn Estuary.

APPEARANCES IN THE BRISTOL CHANNEL AREA

Though unusual numbers of petrels had been seen offshore in the Mersey area at the end of September (Eric Hardy, *in litt.*), with a few isolated occurrences elsewhere, the first record in the Bristol Channel area was of a single bird flying over the New Grounds, Slimbridge, on Oct. 13. No more were seen until Oct. 23, when some appeared along the shore at Brean and one was reported from Bridgend, Glamorgan. There were no reports for Oct. 24, but on 25th one petrel was found dead in the Taw Estuary, three were seen off Steart, nineteen near Burnham, three at the New Grounds, one at Port Talbot and one at Guist Point, Carmarthen. There were also four inland records : two were seen at Cheddar reservoir, one was found dead at Llanishen reservoir, Glamorgan, and one was picked up alive at Porth, in the Rhondda valley, sixteen miles from the sea.

On Sunday, Oct. 26, the numbers were greatly increased. Watchers visiting Brean Down and the beach just south of it saw several hundred petrels flying past and picked up ninety bodies along a short stretch of shore. At Cheddar reservoir two or three live birds were seen and some bodies recovered. No others were found inland in Somerset on 26th but dead or dying birds were picked up in six places in Gloucestershire and there were remarkable numbers in the Severn Estuary. A passenger on the Aust-Beachley ferry saw 200–300 flying over the river during a crossing in mid-afternoon and there were at least as many at the New Grounds (a count of 260 was made from one point and was limited by the effective range of the binoculars used rather than by the birds present). " Great numbers " were reported dead or dying around Sharpness. On the north side of the Channel four were found dead in Glamorgan and ten were seen flying near Pendine in Carmarthen.

Subsequently, Bridgwater Bay became the main gathering place of living birds. About 200 were seen at Steart on Oct. 27 and, although only a few were seen alive along the Burnham-Brean shore on 27th and 28th (perhaps in part from lack of observers), on 29th there were over 250 flying on half a mile of coast south of Burnham lighthouse and 600–800 in the Parrett Estuary. On 30th there were still about 500 over the Parrett, but thereafter survivors were comparatively few, though many bodies were recovered. On 31st about 30 petrels were seen flying near Burnham. Twenty were seen near the jetty there on Nov. 1, but only four on 2nd.

No large numbers of living birds were seen elsewhere in the Bristol Channel area after Oct. 26. There were about 30 at the New Grounds on 29th and 31st. The latest survivor was seen there on Nov. 5. Reports from other places were very largely of single birds : a total of 50–60 from ten localities in Somerset, one at Cheddar, Nov. 2, the latest ; eight from five places in Gloucestershire, Oct. 27 to 30 ; two on 26th and one 27th from

Glamorgan; eleven, Oct. 28, from Carmarthen. The only reports of live birds on the north Devon coast were of " a number " seen at Fremington, Oct. 29, and one at Ilfracombe the same day.

NUMBER OF CASUALTIES IN THE BRISTOL CHANNEL AREA

An attempt to determine the number of petrels which died in the area must, unavoidably, lack precision. Birds washed up on the shore in some places were quickly buried, or washed away again, perhaps to reappear in another place. Some of the bodies may have been recorded independently by two or more observers and many more picked up without being reported at all.

The bodies actually counted along the shores of Bridgwater Bay (from Steart to Brean Down) totalled about 640 but a calculation by N. W. Moore, based on the numbers found along measured stretches on October 26 and 27 and Nov. 9, leads to an estimate of 1,000–2,000 on the beach between the offshore end of Brean Down and Berrow Church (a distance of two miles). Estimates by other observers suggest that at least 300 should be added for the rest of the Bay, giving an estimated total of about 2,400.

Over 270 dead were counted on the Carmarthen coast, and about 120 on the coast of Glamorgan. No considerable numbers occurred on the Devon coast. Few bodies were found on the banks of the Severn: no search was possible at the New Grounds, but the number of casualties there seems likely to have been of the order of 200.

In determining the numbers of inland victims it seems permissible to regard all the birds seen as dead. (All those picked up alive died subsequently, few were seen flying and it is unlikely that more than a small proportion of these could have regained the sea.) There were only four reported from North Devon, but Somerset provided not less than 170, of which about 60 were found at Cheddar reservoir. Gloucestershire records numbered about 70. Two were found in Monmouth, 13 in Glamorgan and nine in Carmarthen. These reported inland casualties amount to about 270. It would be surprising if the recorded total represented more than half the number dying inland.

It appears that the casualties in the Bristol Channel area were certainly not less than 1,300 and were more probably of the order of 3,000.

OCCURRENCE IN OTHER PARTS OF BRITISH ISLES

The earliest reports of large numbers of Leach's Petrels (excluding the September Mersey records already mentioned, which were not in any case very large) come from southern Ireland. Many were seen on the Waterford coast from Oct. 21 to 24 and hundreds appeared in Bantry Bay and the nearby Dunmanus Bay, Co. Cork, on 24th, the numbers of living birds being greatest from 25th to 27th. No other large concentrations were noted in Ireland, but there were many records of single birds, or small numbers, from most parts of the country. Only Carlow, Monaghan and Wicklow are without records, and this in a country notoriously lacking in people interested in birds. The majority of Irish reports of living birds, other than on the south and south-west coasts, refer to October 27 to 30.

In the south-west of England petrels were first found on Oct. 25, but in St. Ives Bay and near Bude, the only places where any numbers were seen, most occurred from Oct. 29 to Nov. 1. No large numbers appeared on the south coast (if an unconfirmed and undated report from Portland is discounted). Records of living birds here fall between Oct. 25 and 31, the most on 27th.

Over 100 dead petrels were found on the Pembrokeshire coast, but it is not clear when these birds arrived there. Some 200 were seen flying off Aberystwyth, Cardigan, on Oct. 25 and 29, with many dead thereafter. Hundreds were seen off the south shore of Caernarvon, especially near Portmadoc, on 25th and at least 100 were still there on 27th, though a large number had died before that. Inland discoveries in central and north Wales were few.

In Liverpool Bay the maximum numbers were seen on Oct. 30 and 31, and casualties along the shore and inland were found mainly on those days and in the first days of November. Further north on the coast of Lancashire and Westmorland, 28th and 29th were the most important dates, though the numbers seen were not large.

On the west coast of Scotland the first appearance of large numbers, in sheltered waters from Argyll to Ayrshire, was on Oct. 26. The main scatter took place on the night of 28th, living birds inland and on the east coast being found on 29th and 30th. There were remarkable numbers inland, over 100 being handled in central Perthshire, but few on the east coast.

No large aggregations were met with inland or on the east coast in England, but the scatter was extraordinarily complete, Rutland being the only county without a record. Live birds were found inland between Oct. 25 and Nov. 9, the great majority between 26th and 31st. The peak in the West Midlands was 26th. Further east and to the north it was 29th.

NUMBER OF CASUALTIES IN THE BRITISH ISLES

Though the petrels were so very widely distributed, the numbers proved to have died were nowhere else so great as in the Bristol Channel. If only counts, and not estimates, are considered, the number found in England (outside the Bristol Channel area) was at least 660. The minimum figure for Wales was 450, for Scotland 340 and for Ireland 300. Thus the number of casualties counted in the British Isles was a little over 3,000. Conservative estimates of the numbers found dead on those shores where the greatest accumulations occurred would add a further 2,300, giving a total of 5,300, without any allowance for birds not found or found but not reported.

OCCURRENCES IN OTHER PARTS OF EUROPE

The reports summarised by Jouanin (1952) indicate that many Leach's Petrels must have been swept on to the western coasts of France and some inland, but it is not possible to give an estimate of the numbers involved. The first birds were seen on Oct. 31 and others on Nov. 1 and 2 (dead).

In Belgium small numbers of petrels were seen flying along the coast near Ostend and at several places on the estuary of the Scheldt. Two live birds occurred far inland and dead ones were reported from eight other localities (Lippens, 1953). All these instances refer to the period Nov. 7 to 13, a time when very few birds were found in Britain (other than bodies which might have been dead some time).

The Swiss bird was found in Basel on Nov. 8. It was the first occurrence of the species in Switzerland (Sutter, 1952).

No petrels were reported from Iceland or Norway.

CAUSES OF THE DISASTER

It was earlier remarked that the appearances of Leach's Petrels in Britain in autumn have been associated with strong winds and it is also known that the species (like other small oceanic birds) is liable to be swept to leeward by strong winds and cannot ride on the water in a severe gale. Indeed, the observations of Rankin and Duffey (1948) suggest that Leach's Petrel is the most vulnerable of the species in the North Atlantic in this respect. In the second half of October and early November the northern and eastern Atlantic and the coasts of Western Europe were swept by gales. The predominant wind direction over the British Isles was south-west. It is noticeable that the Bristol Channel, Bantry Bay, Cardigan Bay, Liverpool Bay and the Firth of Lorne and Loch Linnhe in Argyll, the areas in which the largest numbers of petrels were seen, all face south-west or west : and (though a detailed correlation cannot be attempted here) it can be shown that the differences in time of appearance of greatest numbers in different localities are related to changes in the severity and direction of the winds in those regions. Many observers reported on the way in which petrels, endeavouring to fly against the wind in order to keep offshore, were from time to time carried away by stronger gusts.

Thus it is clear that strong winds were the most important proximate factor responsible for the appearance of the petrels in Britain. But the gales during the period of the " wreck " were not of exceptional severity. Why was the number of birds involved so great, and why, if the species is so vulnerable to high winds, are " wrecks " of this magnitude so infrequent ? (The latest British influx of comparable size was in October, 1891).

Though the information which is available on the autumn movements of the species (see especially Wynne-Edwards, 1935, and Rankin and Duffey, *loc. cit.*) is not sufficient for a very precise determination of the probable distribution in mid-October, it is likely that there is at that time an aggregation of most of the adults in a relatively small area to the east of the Grand Banks, off Newfoundland. This area is certainly frequented by the American breeding population, but it is not known whether all, or any, of the European population assembles there also. Young birds are probably still for the most part at the breeding stations in the middle of October. Leach's Petrel is not a gregarious bird at sea and does not normally form compact flocks, but this autumn concentration in an area from which birds carried to leeward by strong winds would be brought to the shores of Britain seems to offer the most likely, and most economical, explanation of the disaster. The appearance of ' flocks ' in the Bristol Channel and elsewhere was probably due to the ' funnelling ' effect of the coastline, not to congregation. A similar effect was noticeable in the Little Auk (*Plautus alle*) 'wreck' of February, 1950 (Sergeant, 1952).

Presumably the rarity of disasters of this magnitude results from the infrequent occurrence of long-continued, strong winds from the west or south-west at the time when the species is especially concentrated. The normal southward migration during November takes the birds away from the severe gales encountered in the northern Atlantic in mid-winter.

Numerous bodies collected near Brean Down by N. W. Moore were found to be emaciated, and histological examination of several specimens by R. H. Poulding confirmed that the fat reserves of the birds were very seriously depleted. Exhaustion or starvation were the principal causes of death, either directly or indirectly. Many weakened birds fell into the sea and were drowned or, alighting ashore, were unable to feed or to escape from the attacks of gulls, crows and other predators.

Effects of the Disaster

The British breeding population of Leach's Petrel is small. Estimates indicate that it may be about 2,000 pairs. The size of the Atlantic population as a whole is not known, but it will be of considerable interest to see whether the loss of a number of birds greater than the British population has perceptible effects on the distribution of the species.

Miscellaneous Information

N. W. Moore found that all of 37 specimens he examined showed more or less marked evidence of moult of flight- and tail-feathers as well as of body plumage. According to Jouanin (*loc. cit.*), M. J. Estanove of Toulouse, using the degree of ossification of the skull as a criterion of age, found that of 24 specimens examined by him, 14 were adults and 10 young (first winter).

A report on the gut contents of the birds examined by Moore is in preparation. Information on objects apparently taken as food has been provided by several observers. This will be reported, together with notes on other aspects of behaviour, in the account to appear in *British Birds*.

The number of Storm Petrels found at the time of the " wreck ", though unusually large, was very small when compared with the number of Leach's Petrels. A few hundred, at most, were seen alive off the coast. Less than a hundred were found dead (only six in the Bristol Channel area) and very few were seen inland. The accuracy of identification of this species in several reports seems questionable.

Acknowledgments

This summary is based on communications from several hundred people, to all of whom the author is most grateful. It is impracticable to list these collaborators, and invidious to select some for special mention, since the extent of their contributions

has been determined by opportunity rather than by effort. Five exceptions must, however, be made. Mr. N. W. Moore, of the University of Bristol, put the findings from his examination of a large number of specimens at my disposal. Prof. V. C. Wynne-Edwards, of Marischal College, Aberdeen, in addition to collecting and summarising all the Scottish records (with the assistance of Alexander Anderson), has provided much valuable information from his great knowledge of the distribution of sea-birds in the North Atlantic. Major R. F. Ruttledge was largely responsible for the difficult task of collecting and collating the Irish records, and Mr. Eric Hardy took a great deal of trouble in sorting out the numerous records from the Liverpool area. Finally, M. Léon Lippens was kind enough to provide an account of the Belgian records in advance of publication.

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GEOLOGICAL MAPS OF NORTH DEVON AND WEST SOMERSET

By R. Goldring, B.Sc.

(*Read in title to Council, Feb. 19, 1953. Received for publication, March 11, 1953.*)

AMONG the first maps to be published by the Geological Survey of Great Britain were those of North Devon and West Somerset. These maps, prepared by de la Beche on the scale of one inch to the mile, were issued in 1835, and, since that date, now over a century ago, the area has not been remapped. There is, however, the well-known map by J. G. Hamling in the *Proceedings of the Geologists' Association* for 1910, which is also reproduced in the Geological Survey's Regional Handbook of South-West England. This map shows the geology west of the Foreland on the scale of three-quarters of an inch to one mile and thus might well be considered to be almost as accurate in detail as a one inch map. But this, as will be explained, is not the case, and this accuracy was never claimed for the map by its author. It is, in fact, no more than an enlarged sketch-map and therefore has only the accuracy that can be expected of such a map.

The only division in the Palaeozoics shown by de la Beche on his maps is that between what we now recognise as Devonian and Carboniferous. However, it was only a few years after his maps had been published that both the Devonian and Carboniferous rocks were subdivided into named, lithological units, though not until 1867 were these divisions shown on small sketch maps by R. Etheridge (1867) and T. M. Hall (1867) Both their maps showed a simple succession of beds dipping southwards Between the years 1879 and 1906 W. A. E. Ussher published maps of parts of North Devon and West Somerset. The first two, on the scale of one-third of an inch to one mile, showed the area between S. Molton and Dulverton (Ussher, 1879 and 1900) and demonstrated clearly that the structure is far more complex than shown by the sketches of Etheridge and Hall. Later, Ussher combined his two maps with those of Etheridge and Hall, enlarging them all, to show the distribution of the Devonian rocks on the geological map he contributed for the *Victoria History of the County of Devon* in 1906. This map was on the scale of one-quarter of an inch to one mile.

In 1910 J. G. Hamling and Inkermann Rogers led an excursion of the Geologists' Association to North Devon and, for their report, Hamling prepared the map already referred to. The main geological boundaries in his map are those of Ussher and Etheridge, and the map is, in this respect, only a further enlargement of Ussher's already enlarged map of 1906. (Indeed, Mr. Inkermann Rogers recalls that in a conversation between Hamling and Ussher, at which he was present, Ussher told Hamling, "You know, you've got my map, Joe.").

Hamling's intention seems to have been to make a map of North Devon which combined all the existing information as to limestone outcrops, fossil localities, etc., as well as the geological boundaries. The resulting map inevitably closely resembled Ussher's last map, since no further geological mapping had been carried out between the dates of the two publications. Ussher's map, as it was contained in a large volume, could not be easily used, and Hamling's map is the only map of North Devon commonly referred to to-day. The geological map in the *Victoria History of the County of Somerset*, contributed by H. B. Woodward, which widely overlaps Ussher's map, shows only de la Beche's boundary between the Devonian and Carboniferous.

In a few details, Hamling's map does differ from Ussher's. In the Upper Devonian Hamling has preferred Ussher's earlier interpretation which shows an anticline of Baggy Beds between North and South Molton. This was shown by Ussher on his first map (Ussher, 1879) but omitted from his later maps. In the same area, too, Hamling has marked with solid lines the boundaries for which Ussher used only broken lines. Six inch mapping in this part of North Devon by the present writer has shown that Ussher's boundaries cannot be substantiated, and it is therefore probable that Hamling's more definite lines do not reflect an increase of certainty based on field observation. Along the coast east of Lynton, Hamling shows a faulted junction between the Lynton Beds and the Hangman Grits. This is Hamling's only definitely structural contribution to the map, but recent work here shows that this fault is not proved. De la Beche's map showed several lenticular limestones in the Ilfracombe Beds. Hamling includes these and also shows similar lenticles in the Pilton Beds. The outcrop of the Fremington Clay and the position of the Culm veins are also marked, together with many fossil localities.

Mr. Henry Dewey, in his Geological Society obituary of Hamling, wrote that he would best be remembered for his geological map; but Hamling himself, considering the cautious introduction to his map, might prefer to be thought of more as a naturalist, whose stimulus to geological work in North Devon is still felt, and as a great collector.

The author wishes to thank Mr. Inkermann Rogers for his kind help given in conversation.

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C.	Prowse, Miss A. W.	Do.
A.	Prowse, Miss H. S.	9 Alexandra Road, Clifton, Bristol, 8
	Pugsley, Prof. A. G., O.B.E., D.Sc.	Sycamore Cottage, East Harptree, Som.
	Pugsley, Mrs. K. M.	Do.
	Pyke, H. D., M.B., Ch.B.....	88 Redland Road, Bristol, 6
	Pyke, Mrs. H. D.	Do.

	Rake, Miss B. A., B.Sc.	56 Ridgeway, Long Ashton, Bristol
	Read, Miss F. D.	37 Naishcombe Hill, Wick, Bristol
A.	Reeves, J. W.	284 Wells Road, Bristol, 4
	Richards, Mr.	Langley, Swan Lane, Winterbourne, nr. Bristol
	Richards, Mrs.	Do.
	Ricketts, Miss J. B., B.Sc. ..	Los Angeles, Thingwall Park, Fishponds, Bristol
	Riddiford, Miss A. M., B.Sc.	Pinecroft, Alveston, nr. Bristol
	Rogers, Miss M. H., M.A. ..	Vyvyan House, Clifton Pk., Clifton, Bristol, 8
C.	Room, Miss E. M.	Meadowside, Chew Stoke, nr. Bristol
A.	Room, Miss M. A.	Do.
C.	Room, P. J.	Do.
C.	Room, Mrs. P. J.	Do.
C.	Roseveare, W. L.	The Orchard House, Hutton, Weston-super-Mare, Som.
	Ross, F. Stenhouse	25 Tugela Road, Uplands Estate, Bristol, 3
	Russell, R. H.	c/o Summer Cottage, Robin Hood's Bay, Whitby, Yorks.

C.	Sage, C. R.................	Glen Rosa, Highfields, Compton Martin, nr. Bristol
C.	Sage, Mrs. C. R.	Do.
	Salisbury, Miss P. E. J.	67 Station Road, Filton, Bristol
A.	Salmond, P. W.	22 Tyndall's Park Road, Clifton, Bristol, 8
C.	Salter, Miss J. E. R., B.A. ..	74 Reading Road, Wokingham, Berks.
	Sampson, Miss A. M.	142 Coronation Road, Bristol, 3
	Sampson, Mrs. A.	Do.
**H.*	Sandwith, Mrs. C. I., F.L.S.	26 Canynge Square, Clifton, Bristol, 8
	Sargent, A. G. H. A.	15 Upper Belgrave Road, Clifton, Bristol, 8
	Savery, Miss N. J.	129 Redland Road, Bristol, 6
	Savory, J. H.	61 Lower Redland Road, Bristol, 6
	Savory, Mrs. J. H.	Do.
C.	Sayer, Mrs. S.	The Gate House, Ilford, Bradford-on-Avon, Wilts.
L.	Scase, R. P.	Royal Horticultural Society's Gardens, Wisley, Ripley, Woking, Surrey
	Scott, P., M.B.E., D.S.C., M.A.	New Grounds, Slimbridge, Glos.
A.	Sellick, Miss D. E...........	5 West Street, Bedminster, Bristol, 5
	Shaw, Miss D.	48 Kellaway Ave., Westbury Pk., Bristol, 6
*	Shaw, Miss T.	120 Kingsdown Parade, Bristol, 6
	Shinner, H. S.	The Chase, Kingswood, Bristol
	Shinner, Mrs. H. S.	Do.
	Simpson, Scott, M.A., Dr. rer. nat. F.G.S.	Geology Dept., Bristol University
*	Skene, Prof. M., D.Sc., F.L.S.	Dept. of Botany, Bristol University

	Skene, Mrs. M.	36 Lawrence Grove, Westbury-on-Trym, Bristol
	Skinner, R. A.	39 Apsley Road, Clifton, Bristol, 8
	Slater, Miss F.	42 Hampton Park, Redland, Bristol, 6
	Sloane, J. F., B.Sc.	Burwalls, Bristol, 8
C.	Slocombe, D. E.	Upland, Wembdon Rd., Bridgwater, Som.
	Smith, D. Munro, M.R.C.S., L.R.C.P.	Lodge Cottage, Lodge Road, Kingswood, Bristol
	Smith, P. G. Munro	Do.
	Smith, J. H.	21 Upper Belmont Road, St. Andrew's, Bristol, 6
	Smith, Miss M. A. V.	80 Hampstead Road, Bristol, 4
*	Smith, Stanley, M.A., D.Sc., F.G.S.	69 Claremont Road, Bristol, 7
	Smith, Mrs. Stanley	Do.
	Stanhope, Rev. A. J.	182 Bishop Road, Bristol, 7
	Sterne, F. R.	11 Longfellow Rd., Wellsway, Bath, Som.
C.	Stevens, Miss U.	"Swancroft," Compton Martin, nr. Bristol
	Stone, G. S.	9 Bloy Street, Easton, Bristol, 5
A.	Storey, I. D.	1 Wooderry Lane, Blackboy Hill, Bristol, 8
C.	Stubbs, R. L.	Green Orchard, Compton Greenfield, nr. Bristol
	Sutton, M.	14 Woodcroft Avenue, Whitehall, Bristol, 5
C.	Swaine, Miss A. K., F.R.A.S.	Pisang Cottage, Nailsea, Som.
	Tasker, L.	4 Whiteladies Road, Bristol, 8
	Taylor, Miss A. E.	16 Cotham Road, Bristol, 6
	Taylor, S. M., B.Sc., S.I.Mech.E.	23 St. Alban's Road, Bristol
	Tetley, Mrs. H.	4 The Avenue, Sneyd Pk., Bristol, 9
C.	Thompson, A. S.	Westbury Lodge, Heywood, Westbury, Wilts
A.	Titt, D. S.	5 Beaconsfield Road, Clifton, Bristol, 8
**C.*	Trueman, Sir Arthur E., F.R.S., D.Sc., F.G.S.	38 Belgrave Square, London, S.W.1
A.	Tucker, M.	24 West Park Road, Downend, Bristol
	Turner, Mrs. E.	325 Two Mile Hill Rd., Kingswood, Bristol
H.	Turner, H. W., M.A., F.G.S.	The Cottage, Kensington Place, Clifton, Bristol, 8
	Vinnicombe, Miss E. J., M.A.	Denver, Ridgeway Long Ashton, Bristol
	Wakefield, Mrs. G. S.	"Vanda," 2 Southwood Avenue, Coombe Dingle, Bristol, 9
	Walker, Miss A.	Manor Hall, Clifton Hill, Bristol, 8
	Walker, Miss A.	24 Stanley Street, Stapleton Road, Bristol, 5
	Walker, Miss E.	Do.
C.	Wallington, W. A.	"Penwarden," Station Road, West Town, nr. Bristol
C.	Wallington, Mrs. H. E.	Do.
C.	Wallington, Miss J.	Do.
*	Wallis, F. S., Ph.D., D.Sc., F.G.S.	City Museum, Bristol, 8
C.	Wareing, Miss N., B.Sc.	Ivy Cottage, Compton Martin, Bristol
	Wareham, Miss C. A. L.	6 Belvedere Rd., Durdham Down, Bristol, 6
	Wareham, Miss F.	Do.
**C.*	Warne, L. G. G., M.Sc., Ph.D.	Karachi, Pakistan
	Watkins, N.A., M.A., F.R.E.S.	9 Druid Road, Stoke Bishop, Bristol, 9
	Watters, Miss E. D., M.A.	The Little House, Frenchay, Bristol
	Watters, Miss M. M., M.A.	Do.

C.	Webb, H. F.	Elmside, Old Town, Wotton-U-Edge, Glos.
	Weedon, Miss M. F.	12 Luccombe Hill, Redland Green, Bristol, 6
	Weight, L. C.	77 Downs Park East, Westbury Pk., Bristol, 6
	Weight, Mrs. L. C.	Do.
	Weir, Mrs. A. M.	Hursley Hill, Whitchurch, nr. Bristol
**C.*	Welch, F. B. A., B.Sc., Ph.D. F.G.S.	H.M. Geological Survey, Exhibition Road, S.W.7
	Westcott, Miss M. V.	20 Linden Road, Redland, Bristol, 6
	Weston, F. J.	The Tynings, Chew Stoke, nr. Bristol
	Whistler, L. D.	8 Dundonald Road, Redland, Bristol, 6
	White, D. S., B.Sc.	44 The Park, Kingswood, Bristol
A.	White, D. G.	85 Runswick Road, Brislington, Bristol, 4
	Whitehouse, F. W.	8 Old Street, Clevedon, Som.
*	Whittard, Prof. W. F., Ph.D., D.Sc., F.G.S.	Dept. of Geology, Bristol University
C.	Wight, Miss N. W., B.Sc.	23 Clevedon Rd., Weston-super-Mare, Som.
	Williams, E. C.	3 Queen Square, Bristol, 1
	Williams, Mrs. G. E.	Strathmore, Passage Road, Westbury-on-Trym, Bristol
A.	Willis, D. A., F.R.G.S.	18 Church Road, Hanham, Bristol
	Wills, R. F.	40 Claremont Road, Bishopston, Bristol, 7
	Wills, Mrs. R. F.	Do.
	Wiltshire, Miss M. O. P., D.Sc.	Clifton Hill House, Bristol, 8
	Winchester, Miss D. E.	4 Langton Road, St. Anne's Park, Bristol, 4
	Withers, Miss D.	12 Belluton Road, Bristol, 4
**H.*	Womersley, H., F.R.E.S., A.L.S.	Museum, North Terrace, Adelaide, S. Australia
C.	Woodland, P., M.A.	Redwick, Dursley, Glos.
	Wright, M. A.	Woodside, Glebe Rd., Long Ashton, Bristol
*	Yonge, Prof. C. M., F.R.S., D.Sc.	The University, Glasgow

AFFILIATED SOCIETIES

Natural History Society, Diocesan Training College, Fishponds, Bristol
Natural History Society, Grammar School, Dursley, Glos.
Botanical and Zoological Societies, The University, Bristol, 8
Geological Society, Do. Do.
Natural History Society, City of Bath Training College, Newton Park, Newton St. Loe, Bath
Scientific Society, Red Maids' School, Westbury-on-Trym, Bristol
Bristol Grammar School Field Club, Elton Road, Bristol, 8
Kingswood Grammar School, nr. Bristol
Dursley & District Bird Watching & Preservation Society, Sec., Mr. T. P. Walsh, 76 Kingshill Road, Dursley, Glos.
Scientific Group, H.M. Prison, Falfield, Glos.

REPORT OF COUNCIL

1953

THE number of members of the Society has remained fairly constant throughout the year and the membership at present is 390, plus 10 affiliated Societies.

At the Annual General Meeting the officers and members of Council for the ensuing year were duly elected.

Council resolved that the words 'An Honorary Assistant Secretary' be deleted from Rule 11, and that Rule 16 be deleted and the succeeding rules be re-numbered accordingly. The proposal was unanimously accepted at the General Meeting.

The general and sectional Meetings throughout the year were well attended and Field Meetings were planned for the Mendip area.

The year was marked by the successful conclusion of the negotiations for the lease of Steep Holm in conjunction with the Folk House Archaeological Club, the Mid-Somerset Naturalists' Society and the Somersetshire Archæological and Natural History Society. Council's appreciation of the work of Mr. H. Savory, Mr. C. S. Blathwayt and Mr. and Mrs. Mason was recorded.

The Annual Exhibition was held in the Botanical Department by kind permission of the University. Each section made its own contribution and there were others of topical interest. A display of books from the library of the Society was arranged.

The death of Mr. W. R. Taylor, Vice President, was noted with regret.

C. S. CARLILE, *Hon. Secretary*

HON. LIBRARIAN'S REPORT

1953

DURING 1953 the library was used extensively for reference, and 195 books were borrowed. It is encouraging to find that several of our younger members are using the library freely.

A dozen or so new books were obtained in addition to the usual journals and periodicals.

Certain books for which we have little direct use have been sold to provide money for new shelving, binding, new books, and the acquisition of a better and more convenient 'recent acquisition' display stand. There will be new shelves in front of the far window on the right and these are being installed forthwith. The Librarian will be glad to receive suggestions, in the book provided, for new books.

The library has been offered and has accepted, as a gift, certain books on conchology and elementary geology. Most of them are XIXth century books and some of them are quite useful for reference.

J. H. DAVIE, *Hon. Librarian*

The Hon. Treasurer in Account with the Bristol Naturalists' Society

Dr. RECEIPTS AND PAYMENTS FOR THE YEAR ENDING 31 DECEMBER, 1953 Cr.

1952 £ s. d.			£ s. d.	£ s. d.	£ s. d.
	To Members' Subscriptions:—				
	Full Members	1952 ..	6 0 0		
		1953 ..	208 12 6		
		1954 ..	7 0 0		
259 2 6				221 12 6	
	,, ,, of the same household	1953 ..	21 10 0		
		1954 ..	2 10 0		
25 10 0				24 0 0	
	Country members	1952 ..	2 0 0		
		1953 ..	29 8 0		
		1954 ..	4 0 0		
27 11 0				35 8 0	
	"Old" Associates	1952 ..	7 6		
		1953 ..	5 2 0		
		1954 ..	7 0		
5 5 6				5 16 6	
	"New" Associates	1952 ..	5 0		
		1953 ..	6 2 6		
7 12 6				6 7 6	
8 0 0	Affiliated Societies	1953		9 10 0	
333 1 6					302 14 6
	Separates and Covers:—				
6 14 7	,, *Proceedings*, 1952				8 3 0
2 16 6	,, Sale of Publications				8 2 8
18 1	,, Sale of Bird List				7 6
– – –	,, Profit on Dinner				8 6
– – –	,, Field Committee:—				
	Surplus over Expenses				12 9
5 4 8	,, Interest on Deposit in Post Office Savings Bank				6 14 5
348 15 4					327 3 4
296 7 9	,, Balances from last Account ..				352 0 10
	,, Sale of *Zoological Record* (ex Library)				450 0 0
645 3 1					£1,129 4 2

A. H. PEACH, *Hon. Treasurer*.
2 January, 1954

1952 £ s. d.		£ s. d.	£ s. d.
	By Subscriptions:—		
1 1 0	Ray Society	1 1 0	
7 15 0	Zoological Society (London)	– – –	
2 0 0	S.W. Naturalists' Union	2 0 0	
			3 1 0
113 10 6	,, *Proceedings* (1952)		158 16 5
	,, Stationery	15 7 8	
47 18 9	,, Printing	41 4 9	
			56 12 5
	,, Postages, etc.:—		
	Hon. Secretaries	27 12 0	
	Hon. Treasurer	4 14 11	
	Hon. Editor	10 0	
	Hon. Librarian	1 6 1	
37 19 10			34 3 0
6 0 0	,, Fire Insurance (Library)		3 15 0
16 0 2	,, Books and Periodicals		10 10 6
1 0	,, Rent (use of Library room)		1 0
10 6	,, Bank Charges		9 0
20 5 1	,, Fares and Expenses of Meetings ..		8 2 2
6 10 0	,, Clerical Assistance (issue of Circulars, etc.) ..		6 0 0
12 11	,, Field Committee Expenses		– – –
– – –	,, Book-binding		25 18 9
	,, Grants to Sections:—		
– – –	Botanical	10 0 0	
2 17 6	Entomological	5 8 9	
15 0 0	Geological	15 0 0	
15 0 0	Ornithological	15 0 0	
			45 8 9
293 2 3			352 18 0
	,, Balances to next Account:—		
89 1 1	Cash at Bank	116 1 5	
258 0 2	Deposit in Post Office Savings Bank ..	645 6 10	
4 19 7	Cash in hands of Hon. Secretaries	14 17 11	
			776 6 2
645 3 1			£1,129 4 2

Audited and found correct.
Bristol, 11 January, 1954 F. W. EVENS, *Hon. Auditor*

REPORT OF BOTANICAL SECTION

1953

At the Annual General Meeting of the Section held on January 19th, Professor Skene was re-elected President and Mrs. M. L. Davis, Hon. Secretary. Mr. F. W. Evens, Mr. I. W. Evans, Dr. A. F. Devonshire, Mrs. G. S. Wakefield and Miss D. Shaw were elected for a further term of office as Committee Members. After the formal business a talk was given by Mr. I. W. Evans on "A visit to Ben Lawers" which was illustrated with herbarium specimens and photographs. The attendance at this meeting was poor on account of an unusually thick fog which was widespread over the Country. Mr. Evans gave the talk again in April to a more representative audience.

All the following winter meetings were well attended :—

Feb. 16—Mr. F. W. Evens : Some plant forms and patterns.
Mar. 16—Dr. S. M. Walters : The limestone cliff flora.
Oct. 19—Short papers by members :—
    Mrs. G. S. Wakefield : The Botanic Gardens, Penzance.
    Dr. A. F. Devonshire : A visit to County Wicklow.
    Mrs. M. V. Clinch : Reminiscences of a few years spent in the Argentine.
    Mrs. M. L. Davis : Plant life on Steep Holm.
Nov. 16—Mr. C. H. Cummins : A visit to the Austrian Alps and Carinthia.
Dec. 14—Dr. E. W. Jones : The history of British forestry.

A number of Field Meetings were held during the spring and summer months and included Abbots Leigh, led by Miss D. Shaw, and Markham Valley with Mr. C. H. Cummins as leader. Mr. I. W. Evans led several walks, viz. : Clutton and Greyfield Wood, Mangotsfield and Rodway Hill, Troopers Hill and Chequers, and, with the Secretary as co-leader, to Little Stoke and Savages Wood. A walk along the estuary at Severn Beach was led by Mrs. G. S. Wakefield, and Mr. F. W. Evens took a party to Hinton and Dyrham.

At the September Exhibition, arranged by the parent society, the following members of the section staged Exhibits :—

Mr. F. W. Evens : Leaf patterns and methods of seed dispersal.
Mr. E. D. Evens : Microscope slides of carnivorous plants.
Mr. I. W. Evans : Herbarium specimens from the Forres district of Moray, and photographs of rare alpines from Ben Lawers.
Dr. A. F. Devonshire : Map showing routes of botanical walks during the period 1949-1953.
Mrs. G. S. Wakefield : The clover family. Herbarium and living specimens in bloom.
Mr. M. G. Pitman : Bryophytes from Hancock's Wood.

M. L. DAVIS, *Hon. Secretary*

REPORT OF ENTOMOLOGICAL SECTION

1953

AT the 89th Annual General Meeting of the Section, held on January 5, Mr. A. H. Peach and Mr. C. S. H. Blathwayt were re-elected President and Hon Secretary respectively. Mr. Peach gave a talk on " The Clear-wing Moths (*Sesidae*) ".

Apart from the Annual Meeting there were five indoor meetings during the year, at four of which talks were given :—

Feb. 2. Mr. P. Bird : The Ichneumonidae (Ichneumon flies or wasps).
Mar. 2. Dr. H. E. Hinton : Some secondary organs in Lepidoptera.
Oct. 6. Mr. K. H. Poole : Plume Moths.
Nov. 3. Annual Exhibition.
Dec. 7. Mr. C. S. H. Blathwayt. : Winter Moths.

On June 6 the Section held a Field Meeting in conjunction with the Entomological Section of the Somerset Archaeological and Natural History Society at Berrow Sandhills, Somerset.

At the Section's Annual Exhibition on November 3rd a number of interesting exhibits of an entomological nature were shown. The following notes on their exhibits have been received :—

From Mr. I. R. P. Heslop :

'*Apatura iris* Linn. (Purple Emperor). 5 specimens recently taken in the West Country, as follows :—

(i) A female taken in SOMERSET in 1949 by Mr. J. E. Herring.
(ii) A male taken in SOMERSET in 1952 by the exhibitor.
(iii) A male taken in WILTSHIRE in 1952 by Mrs. E. A. Heslop.
(iv) A male taken in WILTSHIRE in 1953 by the exhibitor.
(v) A male taken in WILTSHIRE in 1953 by Mrs. E. A. Heslop.

'*Euphydryas aurinia* Rott. (Marsh Fritillary). A series of 22 specimens (14 males and 8 females) taken by the exhibitor in May and June 1953 on the Turf Moor, Somerset, and including a remarkable lightly-scaled aberation of the male.

'*Thecla betulae* Linn. (Brown Hairstreak). A series of 35 specimens (12 males and 23 females) bred from larvae collected by the exhibitor in May and June 1953 in Somerset. Two of the male specimens show an enlargement of the light patch on the forewings in the direction of female pattern.'

From Mr. R. Henderson on his exhibit of the Brassolidae :

'These broad winged butterflies, whose main distinguishing feature is the large " Eyespot " on the underside of the hindwings (sometimes becoming kidney shaped) are found in Central and South America.

'Some species have the habit of resting on twigs, displaying the underside of the wings, when the large eyespots give the insect a distinct resemblance to the head of an owl—a device for scaring away small predatory birds.

'A curious feature of the butterflies of this family is their habit of flying in the twilight and sometimes again at dawn—a very unusual feature among the Rhopalocera. The flight is somewhat heavy and usually close to the ground.'

C. S. H. BLATHWAYT, *Hon. Secretary*

REPORT OF GEOLOGICAL SECTION

1953

AT the Annual Business Meeting, which was held on January 22, the following Officers were elected: Mr. H. Homeshaw, President; Dr. F. Coles Phillips, Vice-President; Dr. I. S. Loupekine, Hon. Secretary; and Dr. D. T. Donovan, Recorder. Mr. T. R. Fry, Dr. A. Marsden, Mrs. M. Marsden, Mrs. M. M. Perkins, Mr. F. Stenhouse Ross, Mr. H. S. Shinner, Dr. Scott Simpson, Dr. Stanley Smith, Mr. H. W. Turner, Dr. F. S. Wallis and Professor W. F. Whittard were appointed Committee Members. The formal business was followed by the showing of three films, on the subject of "Crystal Growth", which were introduced by Dr. F. C. Frank (University of Bristol). The films, one of which was in colour taken under polarised light, showed the growth of crystals on a slide mounted on the stage of a microscope and gave details of layer accretion under various conditions. One of the films, which was taken by Mr. A. J. Forty in the Physics Department, University of Bristol, showed the actual formation of growth-spirals due to single- and double-screw dislocations, a mode of growth which had been predicted on theoretical grounds.

On February 17 Professor S. E. Hollingworth (University College, London) gave an account, which was illustrated by colour-transparencies, of "Sulphur Hunting in the Andes" in which he described his journeys in Chili which were made in 1951 with a view to surveying the potential reserves of sulphur in the volcanic areas of that country.

On March 19 Mr. M. A. C. Hinton gave an illustrated talk on "Some Pleistocene Researches" in which he recounted his personal experiences both as an early collector and as a former Keeper of Zoology at the British Museum (Natural History).

Six field-meetings were held during the summer. On April 22 the Section saw, under the leadership of Mr. G. A. Kellaway and Mr. Dalton, the bore-hole operations which were being carried out at Ashton Park on behalf of the Geological Survey. On May 9 a day was spent at Lynton, N. Devon, where Dr. Scott Simpson guided a coach party in an examination of the physiographic features with special reference to the catastrophic floods which took place in August 1952. On June 3 Dr. Stanley Smith led an evening meeting at Cotham where a temporary exposure in the new playing field of the Cotham Grammar School gave a good opportunity to collect fine specimens of Cotham Marble *in situ*: the Cotham Marble was mineralised in places (baryte, celestine, goethite, pyrolusite), and on the north side of the field an exposure provided a number of fossils, including the zone ammonite, from the *angulata* beds of the Lower Lias. On July 4, under the guidance of Mr. T. R. Fry, the Section travelled by coach to examine the Great Oolite succession, including the Fuller's Earth at Crossways Inn, the Hinton Sands at Hinton-Charterhouse, and the Bradford Clay at Bradford-on-Avon. On August 5 Mr. E. W. Seavill led a party to the Harry Stoke Drift Mine where Trias, Rhaetic and Lower Lias beds were examined; Mr. W. D. Lytham, Manager of the Mine, kindly showed the workings, both at the surface and underground, and thanks are due to him and to the National Coal Board for making the visit possible. Finally, on September 12, a joint meeting with the University of Bristol Tutorial Class in Geology under the leadership of Dr. F. S. Wallis undertook an examination of the Carboniferous Limestone and overlying Mesozoic strata at Vallis Vale.

On October 20 Dr. J. W. Mitchell (University of Bristol) delivered a lecture entitled "Mountaineering in New Zealand" which was illustrated by excellent colour-slides, most of which were taken when the speaker was on the Geological Survey Staff of New Zealand.

On November 19 Dr. H. Dighton Thomas (British Museum, Natural History) gave an illustrated lecture entitled " Fashions in Fossils " in which he showed, among other points, that in many invertebrate groups evolution has followed similar but independent courses in several lineages at different geological periods.

The Section wishes to record its indebtedness to Miss Theodora Shaw for her generous gift of books and specimens of fossils, minerals and rocks. A number of books have been placed in the Library of the Society, and the remainder, together with the specimens, are being distributed among interested members after exhibition at the meetings of the Section.

I. S. LOUPEKINE, *Hon. Secretary*

REPORT OF ORNITHOLOGICAL SECTION

1953

'THE WREN
THE WREN
THE KING OF
ALL BIRDS . . .'

THE Section has enjoyed another successful year. Nine indoor meetings were held and, by kind permission of the University, these took place either in the Physiology Lecture Theatre or in the Physics Department, Royal Fort.

At the 30th Annual General Meeting, on January 28, Mr. A. C. Leach was re-elected President and Mr. H. H. Davis was again elected Hon. Secretary. Mr. P. J. Chadwick and Miss G. G. Clement were appointed to serve on the General Committee in succession to the retiring members Messrs. A. E. Billett and B. King. At a subsequent committee meeting the following members were co-opted—Messrs. P. F. Bird and G. C. Buxton.

Other winter meetings, devoted chiefly to lantern lectures or films, were :

Jan.	16.	Prof. M. F. M. Meiklejohn : Bird identification.
Feb.	20.	Joint Meeting with the Royal Society for the Protection of Birds. Mr. J. H. R. Boswall : Birds and bird protection in the Shetland Isles.
Mar.	18.	Dr. D. W. Snow : Ornithological researches in Lapland and North Africa.
Sept.	30.	Exhibits and communications by Members.
Oct.	21.	Dr. W. J. L. Sladen : The life-history of the Adelie Penguin.
Nov.	20.	Mr. E. M. Nicholson : Some changes in the status and distribution of birds in Britain.
Dec.	9.	Mr. H. R. Tutt : The life of the Green Woodpecker.

The fourth annual Field-work Report, for 1952, was issued in March. At a Summer Field-programme Meeting on April 1 it was decided, on the recommendation of the General Committee, that the following species be scheduled for special study in the Bristol area during 1953 : Kestrel, Barn Owl, Wood Warbler, Pied Flycatcher and Red-backed Shrike. It was also decided that members should return breeding records for the area of Curlew and Wheatear. Other field-work arranged included nest counts at the heronries, duck counting at the reservoirs, bird ringing and the completion of B.T.O. nest-record cards.

Eighteen members participated in a highly successful all-day excursion to Porlock and Exmoor on May 17, when Black Grouse, Lesser Redpoll and nests of Buzzard, Curlew and Grey Wagtail were among the more interesting observations. Evening Field-walks, four in all, were organized, and took place at Saltford and along the Avon from Pill to the river mouth on May 14 ; at Little Stoke Farm on the 27th ; and over Backwell Hill on June 12.

At the Exhibition Meeting of the Parent Society in September exhibits by members of the Section included drawings of the Hoopoe by Mr. R. V. Culverwell, photographs taken on Steep Holm by Mr. J. H. Savory and a large selection of ornithological reports and journals.

On behalf of the British Naturalists' Association early morning watches for migrating passerines were undertaken on several dates in October. Observations on Steep Holm, and details of an exceptionally large and prolonged movement noted at Aust Cliff are being submitted for inclusion in the B.E.N.A. report for 1953.

It is with deep regret that we record the loss by death during the year of Mr. W. R. Taylor and the Rev. F. L. Blathwayt—two long-standing and highly valued members of the Section. Mr. Taylor, our President for 1948–50, for long played a decisive role in the Clifton College Scientific Society and was at all times an ardent supporter of the B.N.S. Mr. Blathwayt will chiefly be remembered for his many contributions to Dorset ornithology and his whole-hearted support, as President throughout thirty years, of the Ornithological Section of the Somersetshire Archaeological and Natural History Society.

H. H. DAVIS, *Hon. Secretary*

ACCOUNT OF THE GENERAL MEETINGS

1953

THE 90th Annual General Meeting was held on January 15th. Professor W. F. Whittard was unanimously re-elected as President and delivered his Presidential address on " The enigma of the earliest fossils ". This was printed in the *Proceedings* for 1952.

At the February General Meeting a lecture on " Twenty years of exploration for oil " was given by Mr. A. E. Gunther. He spoke in some detail on the conditions necessary for the formation of oil deposits and described modern methods of oil location, including air survey, geology and geophysics. The great increase in oil production and the vital part oil played in the world were graphically described and the question of future supplies discussed technically and politically.

The guest speaker at the Annual Dinner on March 5th was Professor King of Cambridge, whose subject, " Geology and strategy ", provided a most interesting talk and included a first-hand description of the factors which led to the choice of a landing place for the invasion of the continent in the Second World War. Professor King outlined the progress of the Allies after the beach-head had been established and traced the effect of physical and geological conditions on the subsequent advance.

In September the Annual Exhibition was held in the Botanical Department by kind permission of the University. Mr. G. E. Clothier was the secretary and Mr. F. W. Evens the chairman of the committee responsible for the general arrangements. Each section arranged its own contributions. In addition there were exhibitions of topical interest and a display of books from the Library.

Dr. Hannell gave an address on " The Iceland Expedition of 1951 " on October 8. He explained the aims of the " Schoolboys' Exploration Society " and paid tribute to the endurance and courage of the boys. Maps were made in Iceland of regions previously uncharted and much information of value was collected. Commenting on the excellent films as they were shown, Dr. Hannell described the difficulties and hazards encountered in crossing the Hofsjokull ice-cap. Radio communication was maintained with Dunstable and this was the first time that direct weather observation had been established.

The November meeting was the occasion of a talk entitled " Man's influence on the countryside " given by Dr. Thomas. He showed how the countryside as we know it was the result of a complicated interplay of many factors and dealt in some detail with the conditions obtaining on the Chalklands as an example. Dr. Thomas whose wide experience in nature conservancy enabled him to speak with authority interested members of all sections. In conclusion a topical reference to myxomatosis dealt with its causes and its possible ultimate effect.

In December the Society welcomed Dr. Harrison Matthews, Director of the Zoological Society of London. Dr. Matthews spoke on " The life of the Grey Seal " and illustrated his talk with two films which had been taken during his visit to the Island of Ramsay off the Pembrokeshire coast. Here a cow seal and its pup were caught with a net and kept in captivity for three weeks. During this time records were kept of their growth and much useful information was derived as the result.

C. S. CARLILE, *Hon. Secretary*

FIELD MEETINGS

Date	*District*	*Leaders*
25 April	Radstock	Mr. C. S. Carlile Mr. C. L. Bell
16 May	Banwell, Loxton and Brean	Dr. A. Devonshire Mr. A. E. Parslow
13 June	Gordano Valley	Mr. A. C. K. Fear
11 July	Wellow	Mr. H. Homeshaw Mrs. G. Wakefield Mr. O. Phillips
15 August	Dinder and Shepton Mallet	Mr. T. H. Payne
5 Sept.	Blagdon	Mr. F. W. Evens Mr. H. Shinner
9 Sept.	Chew Stoke Reservoir	Mr. T. H. Payne

The Field Committee decided that in 1953 a particular area should be chosen and then six different districts in it selected for exploration at General Field Meetings during the spring and summer. The area chosen was North Somerset and the districts to be worked those shown on the chart.

On the expedition to Radstock, Tyning Colliery was visited. Here tips from the disused colliery were examined where the highly fossiliferous coal measures were of great interest to the geologists.

An appropriate talk was given by Mr. T. R. Fry on the nature of the Radstock area, a dissected plateau about 500 feet above sea-level, the lower part of the hill slopes being formed by the Keuper and the upper parts occasionally capped by Inferior Oolite. Two special features were noted ; the calcareous and attenuated Lias and the fossil-bearing coal measures, which are not as a rule seen at the surface.

A visit was then made to Stantonbury Hill and the fine camp on the line of Wansdyke. Botanists found many plants of interest among which were *Cadamine pratensis*, *Draba verna*, *Potentilla sterilis* and *Erythraea centaurium*.

At the May meeting the geology of the Western Mendips was observed from the top of Loxton hill. On the slopes there was a plentiful limestone flora which included *Cerastium arvense*. The afternoon was spent on Brean Down, where two ravens which had successfully nested earlier in the year were seen. Members studied the limestone and sea-cliff flora including a number of ephemerals. The most interesting plants found were the white rockrose, *Helianthemum oppeninum*, growing abundantly on the south slope, *Silybum marianum*, *Ranunculus parviflorus*, a *Cotoneaster microphylla* and *Koeleria vallesiana* (whose only British station is on the Down).

The June meeting in the Gordano Valley was very interesting both geologically and archaeologically. Some time was spent gathering algae from the rhynes behind Portbury Church and in examining them under microscopes brought to the field by the leader. Specimens of iron-ore were collected in Clapton-in-Gordano and later the Blackrock quarries were visited for their botanical and geological interests. In a walk over Walton Down, various earthworks of Iron-age date were pointed out and botanical specimens collected.

The principal objects of the July field meeting were to see rocks and soils of the area south and west of Bath, to study connection between them and the surface features and vegetation of the locality, to note the action of streams and rivers in dissecting a former extensive plateau into a pattern of hills and valleys and to relate the local freestone to buildings constructed of those rocks. A Kingfisher was seen by Wellow brook and the botanists found the following plants :—*Apium graveoleus, Veronica beccahunga, Prunella vulgaris* (pink variety), *Cystopteris fragilis* and *Hypericum elatum.*

It rained heavily on August 15th and field work was mainly replaced by visits to Shepton Mallet museum and Croscombe and Dinder churches.

September 5th was a sunny afternoon and the party first visited Yeo reservoir where a few Great Crested Grebes, a large number of Coot and other water fowl were seen. On the walk to Lower Ellick Farm, one field had a good quantity of Meadow Saffron (*Colchicum autumnale*) in full bloom. Other plants seen were White Horehound (*Marrubium Vulgare*), Dogwood (*Cornus sanguinea*) in fruit and many Honeysuckle (*honicera periclymenum*) in bloom for the second time. The swallet holes where both East and West Twin Brooks from Blackdown disappear underground were seen. At Rickford Hill members saw the reappearance of the West Twin Brook on the surface. after it had crossed the East brook underground on its way to its outlet at Langford. Some of the party also visited Goatchurch Cavern.

An extra evening meeting was arranged for September 9th when members went to see the excavations being carried out on the site of Chew Stoke reservoir.

I. M. JAGO, *Hon. Field Secretary*

OBITUARY

Wilfred R. Taylor

A GREAT loss has been sustained in the passing of W. R. Taylor, who died suddenly, after a long period of ill-health, on September 7, 1953. He had rendered us whole-hearted service during the years that he was a member, and among the names of those who have made their mark in the building up of this Society, his will hold an honoured place.

His name first appears on the members' list in our *Proceedings* for 1927; he was thus a member of the Society for twenty-seven years, during which he belonged to the Ornithological and Entomological Sections. He was an Ordinary member of Council from 1935 to 1939, again from 1946 to 1947, and once more in 1951. He was President of the Ornithological Section in 1948, '49 and '50. He was nominated for Presidency of the Parent Society in 1950 but ill-health prevented him from accepting office. He was Vice-president of the Parent Society in 1952, an office he was still holding at the time of his death.

It is fitting also to mention his activities in the interests of Ornithology in other directions. He was a member of the Ornithological Section of the Somersetshire Archaeological and Natural History Society for twenty-eight years, his name first appearing in the *Somerset Bird Report* for 1926. His many observations at the North Somerset Reservoirs and elsewhere are recorded in reports for subsequent years. He succeeded the late B. W. Tucker as President of the Section and continued to hold office until the end of 1952, when he resigned for health reasons. He was almost entirely responsible for the compilation of the 1951 and 1952 *Reports*. The latter, which included his article on the great 'wreck' of Leach's petrels, Oct.-Nov., 1952, one of the largest reports the Section had ever produced, was completed to the last detail but a week or so before his death: it will indeed stand as a memorial to him.

By profession he was a schoolmaster. Of the years before he entered our ken it may be said of him that he was educated at St. Edmund's, Canterbury; winning a scholarship, he went on to Jesus College, Cambridge, afterwards returning to his old school as assistant master. On the outbreak of war in 1914 he took a commission in 'The Buffs'. He was twice wounded in action, the second time, in 1917, lying out on the field of battle grievously wounded until later picked up by the enemy. In a German Prison Camp Hospital he lay between life and death for many months. His life was saved by the devoted care of a fellow prisoner—a Russian doctor. Liberated at the end of the war, he came home, because of his wound, lame for life. Two years or so later he joined the Staff of Clifton College, where he worked for thirty years until his retirement in 1951. He became head of the History Department in 1941 and for the greater part of his time was House Master of South Town, a fact that led to many friendships made at the School being continued afterwards in the ranks of this Society.

He will be remembered for two outstanding characteristics. As an Ornithologist, for his insistence on absolute accuracy in the written word, for no detail of any Ornithological record can ever be in doubt if 'W.R.T.' had anything to do with the editing of it. And as a man, for his generous spirit in always putting before his own personal interests his service to those with whom he was associated ; in the sphere of Ornithology, encouraging beginners and inspiring high standards and enthusiasm in all. His kindly outgoing towards others attracted others towards himself and, should it be asked why a host of friends held him in such esteem and affection, perhaps the real answer would be that in him a steadfast faith was behind it all.

H. S.

Sir Lewis L. Fermor

As we go to press we learn with deep regret of the death on May 24 of Sir Lewis Leigh Fermor, O.B.E., D.Sc., F.R.S. Sir Lewis was President of the Bristol Naturalists' Society from 1945 till 1947. An obituary will be published in Part VI of the present volume of the Proceedings.

BRISTOL BOTANY IN 1953

By Cecil I. and N. Y. Sandwith

(Received and read in title to Council, Feb. 25, 1954.)

1953 was a drier year than usual in the West Country, and was notable for little rain in the first three months and exceptionally mild autumn weather which lasted until December 31st (a very cold day, with frost), so that winter seemed never to be coming. At the end of January there was an eclipse of the moon on the 29th, at the time of those strong gales which blew down trees here and, joining with high tides, caused such havoc on the East Coast. March, as so often, was a dry month with many warm fine days. Except for a hot spell at Whitsun, the last half of May and much of June were chilly and wet, and Christmas itself was said to be warmer than Coronation Day. July was a wet month with storms and cold winds, but the first part of August was warm and dry, and so was early September. There were gales with heavy rain both in late August and late September, but October was a pleasant autumn month with mild and sunny days, and the mildness continued through November and December, which were damp and misty with little sun. A remarkable feature of the season was that many trees began to show signs of their leaves changing colour in mid-August, but in spite of this the colours were brilliant through the autumn and lasted longer than was expected.

Mr. G. W. Garlick has continued his very useful field-work on the Gloucestershire side of the district. Having moved from Horton to Yate, he was able to cover much ground new to him, and has sent us another excellent series of records. These fill gaps in the distributions of many species, and also show how a keen observer with the requisite knowledge can demonstrate that some of the more critical plants, such as *Polygonum nodosum, Sparganium neglectum*, *Carex Pairaei* and *Glyceria declinata*, are much more frequent than had been suspected by botanists living in Bristol. As before, we have made a selection from Mr. Garlick's records, abbreviating his name as " G.W.G."

Specimens of nearly all the Sedges and Grasses mentioned in these notes were named or confirmed by Messrs. E. Nelmes and C. E. Hubbard, and Mr. V. S. Summerhayes identified all the Marsh and Spotted Orchids. We are most grateful to them for this help, and particularly to Mr. Hubbard who, in the midst of all his important work, has never refused to examine the numerous Grasses brought to him from our docks and tips.

Ranunculus hederaceus L. By pond at Pod Farm, Iron Acton, **G.**, *G.W.G.*

Fumaria Boraei Jord. Cornfield between Rodford and Nibley, near Yate, **G.**, *G.W.G.*, perhaps Miss Roper's locality recorded in *Journ. Bot.* 1918, p. 16. Quarry below the Old Church, Uphill, **S.**, *G.W.G.*

Rorippa islandica (Oeder) Borbás. Ponds at Coalpit Heath, Westerleigh and Iron Acton, **G.**, *G.W.G.*

Barbarea verna (Mill.) Aschers. Roadside, Vobster, **S.**, *J. P. M. Brenan.*

Cardamine impatiens L. Below Crook Peak, **S.**, *Miss P. Puttee*, fide *Miss E. Rawlins.*

Reseda lutea L. Bury Hill, Winterbourne ; and roadside, Rangeworthy, **G.**, *G.W.G.*

Dianthus deltoides L. A specimen of the Maiden Pink, labelled " Clifton Rocks ", **G.**, " July 22, 1910 ", and collected by the late *W. Prowse*, was recently given to us by his grandson, *Dr. David Prowse.* We know of no previous record of the Maiden Pink from St. Vincent's Rocks or elsewhere at Clifton, apart from the unlocalised record of Thwaites mentioned in *White, Fl.*, p. 181, and a casual occurrence at Ashton Gate. Of course, a number of plants have been introduced on the Rocks, but the Maiden Pink has never been reported as one of them. It is not a limestone species, but might occur as a native on the Millstone Grit. We understand that the finder was an intrepid climber. It is possible, then, that *D. deltoides* may be rediscovered on the Rocks.

Minuartia tenuifolia (L.) Hiern. Ploughed field above Lizens Wood, Kilcot, **G.**, *G.W.G.*

Sagina ciliata Fr. Engine Common, Yate, **G.**, *G.W.G.*

Spergula sativa Boenn. On sandy soil, Yate Common, **G.**, *G.W.G.* The first record for the Glos. side of the district. This plant is no doubt best treated as a variety of *S. arvensis* L.

Montia. Dr. S. M. Walters has an important paper on British forms of *M. fontana* L. in *Watsonia*, iii. pt. 1, pp. 1–6 (1953). He finds that four subspecies occur in these islands. These are best distinguished by their ripe seeds, which are described and figured in this paper. It is probable that subsp. *chondrosperma* (Fenzl) Walters, with dull, roughly warty seeds, is the plant most often met with in our district : we have it from Keynsham, and from two spots on the peat moors, **S.** Subsp. *intermedia* (Beeby) Walters was found " near Beacon, Shepton Mallet ", **S.**, in 1885, see specimens preserved in the Herbarium of the National Museum of Wales, Cardiff, and was refound on Beacon Hill last summer by *N.Y.S.* Subsp. *variabilis* Walters is reported from vice-county 6, **S.**, on the strength of material in the Cambridge University

Herbarium collected by *Dr. C. E. Moss* on the " turf moor " in 1912. It will now be interesting to re-examine *Montia* in all its localities on both sides of our area.

Hypericum dubium Leers. *G.W.G.* finds this in four stations at Coalpit Heath and Westerleigh, **G**.

Tilia platyphyllos Scop. Foxholes Wood, Kilcot, **G**., one young tree no doubt introduced, *G.W.G.*

T. cordata Mill. Splatts Wood, Kilcot, **G**., two trees, *G.W.G.*

Geranium pratense L. A form with very pale lilac-purple flowers (cf. var. *lilacinum* Celak.) and with pink (not blackish) anthers, said to flower three weeks later than the common form, has been found growing for about 300 yards along banks of a lane near Holcombe, **S**., by *Miss M. L. Ellis*. Roots have been planted at Kew.

G. purpureum Vill. The true plant occurs very locally on limestone rock in Cheddar Gorge, **S**., We were directed to the spot by *Dr. H. G. Baker*, of Leeds University, who is making a special study of this species and himself collected it at Cheddar in 1945–6. He also reports that *Miss I. M. Roper* gathered it there in 1918, her specimen being preserved in her herbarium at Leeds University. But he writes that at least one of the specimens on which previous records of *G. purpureum* at Cheddar have been based, *viz*., that of Drummond-Hay mentioned in *White, Fl.*, p. 217, was misidentified, and it must be remembered that this species was confused with forms of *G. Robertianum* by most British botanists until well on in this century. It still grows on both sides of the Avon Gorge at Clifton.

Impatiens capensis Meerb. By the Wellow brook, near the packhorse bridge, **S**., 1946, *D. Coombe.*

Genista anglica L. Fortunately, this survives on Yate Common, **G**., on the edge of a drain, and also grows along the railway line between Yate and Rodford, *G.W.G.*

Medicago lupulina L. " var." *unguiculata* Rchb. Yate, Yate Rocks and Coalpit Heath, **G**., *G.W.G.*

M. × *varia* Martyn. Field above Blagdon Lake, **S**., *I. W. Evans.*

Melilotus altissima Thuill. Near Wedmore, **S**., *O. M. Hallam* in *Rep. Bot. Sect., Som. Arch. and Nat. Hist. Soc.* for 1952.

Trifolium incarnatum L. Mineral railway, Froglane Pit, Coalpit Heath, **G**., *G.W.G.*

T. striatum L. Yate Court, Yate Rocks, and between Nibley and Rodford, **G**., *G.W.G.*

T. scabrum L. Rare on rocky ground at Yate Rocks, **G**., *G.W.G.*

T. micranthum Viv. On limestone near Yate Rocks ; in a quarry east of Yate Court ; and in Long Coombe, Kilcot, **G**., *G.W.G.* Slopes of Mendip above Rodney Stoke, **S**., *C.I.S.* and *N.Y.S.*

Vicia Cracca L., with white flowers. On the old mineral railway near Parkfield Colleries, **G.**, *G.W.G.* A very uncommon albino, in our experience. We have no previous record from the district.

Lathyrus latifolius L. Laneside, Tytherington Hill, **G.**, *G.W.G.*

Crataegus oxyacanthoides Thuill. Wood-border on summit of Stinchcombe Hill, **G.**, Dursley side, *C.I.S.* and *N.Y.S.*

Epilobium hirsutum L. × *montanum* L. Inglestone Common, **G.**, 1952, *G.W.G.* Determined by *Mr. G. M. Ash.* New to the district.

E. adenocaulon Hausskn. Whitewell Bottom and Splatts Wood, Kilcot, **G.**, *G.W.G.*

Sium erectum Huds. Along a drain between Lyde Green and Folly Brook, **G.**, *G.W.G.*

Œnanthe pimpinelloides L. In a damp pasture by a stream between Benter and Blacker's Hill, near Nettlebridge, **S.**, *J. P. M. Brenan.*

Galium × *ochroleucum* Syme. Two localities near Kilcot, **G.**, *G.W.G.*

Dipsacus pilosus L. By an artificial pond north of Horton Church, **G.**, *G.W.G.*

Carduus tenuiflorus Curt. Limestone quarry at Cross, **S.**, *C.I.S.* and *N.Y.S.*

Cirsium dissectum (L.) Hill. Boggy pasture on Mendip between Thrupe and Masbury, **S.**, *J. P. M. Brenan.*

Monotropa Hypopithys L. Under beeches on the west side of Lansdown Lane, Bath, **S.**, *Dr. A. F. Devonshire.* The specimens are the forma *glabra* Roth, with quite glabrous flowers.

Anagallis tenella (L.) Murr. Sparingly in a boggy pasture on Mendip between Thrupe and Masbury, **S.**, *J. P. M. Brenan.*

Centaurium minus Moench (*C. umbellatum* Gilib.). With white flowers on the edge of a wood at Weston-in-Gordano, **S.**, *Miss M. E. Habgood.*

Symphytum grandiflorum DC. Naturalised in woodland on Wraxall Hill, **S.**, *Miss Eileen French.*

Myosotis sylvatica Ehrh. Side of drain in hedge near Goose Green, Yate, **G.**, *G.W.G.* A garden escape in this locality.

Verbascum nigrum L. A small colony in steep limestone turf east of Bangel Wood, Upper Kilcot, **G.**, *G.W.G.*

Veronica agrestis L. Walls and roadside, Westerleigh to Nibley; and between Rangeworthy and Tytherington, **G.**, *G.W.G.*

Lathraea Squamaria L. In several woods at Kilcot, Hillesley and Alderley, **G.**, *G.W.G.*

Thymus pulegioides L. Quarry at Chipping Sodbury, **G.**, *G.W.G.*

Clinopodium vulgare L. With white flowers in a quarry on Tytherington Hill, **G.**, *G.W.G.*

Stachys sylvatica L. forma *monstrosa* Druce in *B.E.C.* 1920 *Rep.*, p. 142 (1921). This sport with greenish corollas has been found in a lane near Tytherington, **G.**, by *G.W.G.* Presumably, it is also the forma *viridiflora* Fischer-Ooster of *Fl. Glos.*, p. 391. We do not know which name is the earlier.

Galeopsis Tetrahit L. var. *bifida* (Boenn.) Lej. et Court. Field near Yate Rocks, **G.**, *G.W.G.*

Salicornia ramosissima Woods. Pill between Avonmouth and Chittening, **G.**, *Mrs. Winifred Cummins.* New to the Glos. side of our area, and to district 5 of *Fl. Glos.*

Polygonum nodosum Pers. *G.W.G.* reports this from many stations near Yate and Wickwar, **G.**

Euphorbia platyphyllos L. Still at Filton, **G.**, on a railway-bank, *Major G. MacGeorge.*

E. Characias L. A species of Southern Europe, well-known in gardens. A specimen forwarded to us by *Miss E. Rawlins* had been gathered on rocks beyond Sand Bay, towards Woodspring Priory, **S.**, where the plant must have been introduced.

Salix purpurea L. Marshy valley in Leigh Woods, **S.**, 1920 and 1934, *C.I.S.* and *N.Y.S.*

S. aurita L. S.W. corner of Horton Bushes, **G.**, *G.W.G.*

S. repens L. Boggy field on Mendip between Masbury Castle and Thrupemarsh Farm, **S.**, *C.I.S.* and *N.Y.S.*

Populus balsamifera L. Alderley Wood, **G.**, *G.W.G.* This Balsam Poplar has glabrous leaves which are broadly lanceolate to ovate and more or less wedge-shaped at the base.

P. × *gileadensis* Rouleau. Kingrove Lane, Sodbury, and Yate, **S.**, *G.W.G.* This tree, with broadly cordate-ovate leaves pubescent beneath, is, we suspect, the more commonly planted Balsam Poplar of our area. It is said to be the hybrid *P. deltoides* Marsh. × *balsamifera* L.

Spiranthes spiralis (L.) Chevall. Quarry, Tytherington Hill, **G.**, *G.W.G.*

Orchis praetermissa Druce. Long Coombe, Kilcot, **G.**, *G.W.G.* Mr. Garlick finds this species in two marshes near Yate Rocks, **G.**, one of which is probably the locality " between Sodbury and Wickwar, *Hb. Bucknall* ", of *Fl. Glos.*, p. 451, while the other is the " marsh below Yate Rocks, *Miss Roper*," under *O. latifolia* L., in *White Fl.*, p. 557.

O. Fuchsii Druce × *praetermissa* Druce. Near Yate Rocks ; and Long Coombe, Kilcot, **G.**, *G.W.G.*

O. ericetorum (Linton) E. S. Marshall. In two spots north of Goose Green Farm, Yate ; and in the Lower Woods, east of Wickwar, **G.**, *G.W.G.* Pasture on Potter's Hill, Barrow Gurney, **S.**, 1929, *C.I.S.* and *N.Y.S.* *O. ericetorum* has not previously been noted so close to Bristol, but the last-named station may by now have been ploughed up.

Allium vineale L. var. *vineale* (var. *bulbiferum* Syme). Near Yate Rocks; and north of Hawkesbury, **G.**, *G.W.G.*

A. roseum L. Roadside at Sidcot Corner, **S.**, *Miss E. Rawlins.*

Convallaria majalis L. Abundant in Splatts Wood, Kilcot, **G.**, *G.W.G.*

Juncus compressus Jacq. Yate, Engine Common and Goose Green, **G.**, *G.W.G.*

Typha latifolia L. *G.W.G.* sends us many new stations, from Frampton Cotterell, Coalpit Heath, Yate, Rangeworthy, Wortley and Kingswood, **G.**

Sparganium neglectum Beeby. Verified in several localities at Coalpit Heath, Westerleigh, Rangeworthy and Wickwar, **G.**, *G.W.G.*

Scirpus setaceus L. Boggy pasture between Thrupe and Masbury, **S.**, *J. P. M. Brenan.*

S. lacustris L. Pond at Wickwar, **G.**, *G.W.G.*

Carex divisa Huds. Edge of a pool near Berrow Church, **S.**, *Miss Agatha Miller*, and seen there in 1953 by *Miss E. Rawlins*, specimen verified by *Mr. E. Nelmes.* This confirms Dr. C. E. Moss's note of *C. divisa* as " an occasional species " among the dune-marsh plants of our Channel shore (see *White, Fl.*, p. 625).

C. disticha Huds. Between Goose Green Farm and Yate Rocks, **G.**, *G.W.G.*

C. Pairaei F. Schultz. *G.W.G.* finds this frequently in the area bounded by Coalpit Heath, Iron Acton, Nibley and Westerleigh, **G.**

C. polyphylla Kar. et Kir. Quarry, Yate Rocks; and Long Coombe, Kilcot, **G.**, *G.W.G.*

C. × *Kneuckeriana* Zahn. Drain north of Goose Green Farm, Yate, **G.**, *G.W.G.*

C. pilulifera L. Greyfield Wood, Hallatrow, **S.**, *I. W. Evans.*

C. strigosa Huds. Wapley Common, Westerleigh; and Alderley Wood, **G.**, *G.W.G.*

C. demissa Hornem. With *C. ovalis* Good and *C. panicea* L. in a boggy pasture on Mendip between Thrupe and Masbury, **S.**, *J. P. M. Brenan.*

C. hirta L. forma *spinosa* Mortensen. Marsh west of Yate Rocks, **G.**, *G.W.G.*

C. pseudocyperus L. Still near Westerleigh, **G.**, in two stations, *G.W.G.*

Agrostis tenuis Sibth. *G.W.G.* finds the awned form, forma *aristata* (Hook.), at Parkfield Colliery, near Westerleigh and at Kilcot, **G.**, all *det. C. E. Hubbard.*

A. gigantea Roth. Portway tip below Sneyd Park, **G.**, *I. W. Evans.*

Sieglingia decumbens (L.) Bernh. Between Thrupe and Masbury, **S.**, *J. P. M. Brenan.*

Glyceria × *pedicellata* Towns. In several spots near Yate and Wickwar, **G.**, *G.W.G.*

G. declinata Bréb. Frampton Cotterell, Coalpit Heath, Lyde Green, Westerleigh and Yate Common, **G.**, *G.W.G.*

Bromus racemosus L. Westerleigh, Yate and Little Sodbury, **G.** *G.W.G.*

B. Thominii Hard. Bury Hill, Yate Rocks; and quarry east of Yate Court, **G.**, *G.W.G.* Avonmouth Dock, **G.**, *C. C. Townsend.* Limestone quarry at Cross, **S.**, the forma *hirsutus* (Holmb.), *C.I.S.* and *N.Y.S.* The first published records for the district of this species, which lies between *B. hordeaceus* and *B. lepidus* and no doubt is plentiful. All the specimens were verified by *Mr. C. E. Hubbard.*

Nardus stricta L. Sparingly in a boggy pasture between Thrupe and Masbury, **S.**, *J. P. M. Brenan.*

Botrychium Lunaria (L.) Sw. Engine Common, Yate, **G.**, a very few fronds on an old colliery-site, *G.W.G.* An excellent discovery. So far as we know, there has been no record of the Moonwort within living memory from the Glos. side of our district.

Dryopteris Borreri Newm. In *Watsonia*, iii. pt. 1, 57–65 (1953), *Miss J. P. Pugh* has a paper on the distribution in Britain of this fern. Under vice-county 6, she gives the following localities which are new to us for **S**: Badgworth, 1886, *H. W. Pugsley*; Portbury, 1899, *id.*; Hallatrow, 1918, *I. M. Roper*; Weston-super-mare, 1860, *Mrs. Walker.* All these records are supported by specimens seen by Miss Pugh in various herbaria cited by her.

D. spinulosa (Müll.) Watt. Ram Hill Wood, Westerleigh, 1953; and Withymore Wood, Hillesley, **G.**, 1952, *G.W.G.*, specimens confirmed by *Mr. P. Taylor.* There has been no record from the Glos. side within living memory, and Mr. White never saw it there. Two clumps still survive in an enclosure on Walton-in-Gordano moor, **S.**, where Miss Roper first reported the species in "Bristol Botany in 1917," *N.Y.S.*

Chara vulgaris L. var. *longibracteata* (Kütz.) Kütz. Ponds at Little Sodbury End, Horton, and on Inglestone Common, **G.**, *G.W.G.*, who also reports var. *papillata* Wallr. from these three localities.

Nitella opaca Agardh. Pond, Little Sodbury End, **G.**, *G.W.G.*

Tolypella intricata Leonh. Pond near Vinney's Lane, Horton, and in two ponds on Inglestone Common, **G.**, *G.W.G.* This interesting species had not been seen in our district for many years.

ALIENS. At Avonmouth Dock, **G.**, *Messrs. C. W. Bannister* and

C. C. Townsend collected *Sisymbrium Irio* L., *Malva nicaeënsis* All. (hairy-fruited form), *Coronilla scorpioides* (L.) Koch, *Anacyclus clavatus* (Desf.) Pers., *Chrysanthemum coronarium* L. var. *discolor* Urv., *Centaurea salmantica* L. and *Solanum rostratum* Dun., all first records for the Dock, while *Lathyrus annuus* L., *Cephalaria syriaca* (L.) Schrad., *Fagopyrum tataricum* (L.) Gaertn. and *Bromus rubens* L. had not been noted there for some years. Our own finds at Avonmouth included *Eruca sativa* Mill. var. *eriocarpa* (Boiss.) Host, *Aegilops ligustica* (Sav.) Coss., a second record for Bristol and new to Glos., and two Wheats, *Triticum compactum* Host var. *Humboldtii* Koern. (" Hedgehog Wheat ") and *T. aestivum* L. var. *erythrospermum* Koch, which are new to the Bristol adventive flora.

Mr. I. W. Evans collected *Sisymbrium Irio* L. on waste ground in Newfoundland Road, Bristol, **G.** ; and on St. Anne's tip, **S.**, in 1952, he found *Gypsophila scorzonerifolia* Sér. (*G. acutifolia* Fisch. var. *latifolia* Fenzl.) and *Mentha* × *cordifolia* Opiz.

Mr. G. W. Garlick reports *Sisymbrium orientale* L. from two localities at Yate, **G.** ; *Camelina sativa* (L.) Cr. from a tip at Rodford, Westerleigh, **G.** ; *Silybum Marianum* (L.) Gaertn. from waste ground at Chipping Sodbury, **G.** ; and isolated specimens of *Lactuca Serriola* L. from a dump near Lyde Green and a wall between Kendleshire and Winterbourne Down, **G.**

Coronilla varia L. A form with few (3–9) flowers in the head persists on waste land by the Bristol road at Bath, **S.**, *I. W. Evans*, but the specimens do not agree with the descriptions of var. *pauciflora* Griseb. and var. *pyrenaica* (Mailho) Rouy, which combine few-flowered inflorescences with other characters not shown in the Bath specimens.

Helianthus laetiflorus Pers. var. *laetiflorus*. Portway tip, Sneyd Park, **G.**, *C. C. Townsend.* Disk corolla lobes yellow. To this must be referred our Avonmouth (1931) specimen which was recorded as *H. rigidus* Desf. in *The Adventive Flora of the Port of Bristol. H. rigidus*, which has the disk corolla lobes purple, is now treated as *H. laetiflorus* var. *rigidus* (Cass.) Fernald.

ADDITIONS TO THE FLORA OF STEEP HOLM, **S.** *Mrs. M. L. Davis* visited the island on no less than three occasions in 1953, including a long week-end. Together with other members of the Botanical Section she made the following additions to the flora : *Senecio vulgaris* L. var. *radiatus* Koch, *Plantago major* L., *Polygonum Persicaria* L. and *Festuca rubra* L. var. *pruinosa* (Hack.) Howarth. The grass, which was collected by *Mr. I. W. Evans*, was determined at Kew by Mr. Hubbard. On one of these visits *Mr. E. D. Evens* added the Hepatic, *Lunularia cruciata* (L.) Dum. (previously, three Hepatics had been recorded from the island).

ORNITHOLOGICAL NOTES, BRISTOL DISTRICT, 1953

Compiled from Reports of Members of the B.N.S. Ornithological Section

By H. H. Davis and P. J. Chadwick

(*Read in title to Council, Feb. 25, 1954. Received, March 16, 1954.*)

RECORDS for 1953 are the result of observations by forty-two members of the Section and various non-member contributors. As usual, the Bristol Waterworks Company's reservoirs, and the New Grounds and other favoured bird haunts in the Severn Estuary, have been under frequent review. Activities have also been extended to the Chew Valley, where the new Chew Stoke reservoir, still in partial completion, is already proving a marked attraction to bird-life. This enormous reservoir, 1,200 acres over-all and eight miles in perimeter, will have a maximum storage capacity (4,500 million gallons) exceeding that of the Barrow Gurney, Blagdon and Cheddar reservoirs combined.* Its ultimate effect on the numbers and distribution of grebes, ducks and other water birds in North Somerset will be watched with considerable interest.

Among the more important records for the year are those of a Hoopoe at Cotham Park in April and another at Portishead in August–September ; single Eiders in the Channel off Steep Holm in April and Brean Down in December ; over ninety Whimbrel together at Cheddar reservoir in May ; Quail, up to half a dozen, at Marshfield in July ; Manx Shearwaters inland, following south-westerly gales in August ; a Little Gull at Barrow Gurney in September ; and Purple Sandpipers at Severn Beach in December. Pied Flycatchers on spring passage were seen in widely separated localities on both sides of the City, and Crossbills, maximum of sixteen, were noted on various dates near Oldbury-on-Severn in October–November.

Waders on autumn migration at the reservoirs included a Wood Sandpiper at Cheddar ; Spotted Redshanks at Blagdon ; a Curlew Sandpiper (perhaps two birds) at Blagdon ; and Grey Phalaropes at Cheddar, Chew Stoke and Barrow Gurney. Wintering Common Sandpipers were noted at Cheddar, January to early March, and a Greenshank, probably wintering, was reported from Blagdon in late November.

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* Acknowledgment is due to the Bristol Waterworks Co. for placing these particulars at our disposal.

Noteworthy reports from the New Grounds are of Wood Sandpipers in August ; Ruffs, up to the exceptional number of thirty-two together, September–December ; a Spoonbill in October ; and two wintering Greenshanks in December. White-fronted Geese on the saltings were present in record numbers in January, while other interesting visitors were three Greylags, three Lesser White-fronts, five or more Bean Geese, six Brents, and at least three Barnacles. For the Pink-footed Goose a peak total of 103 was returned in early November.

The following members have contributed—Miss J. Bannister, S. H. G. Barnett, A. E. Billett, the late Rev. F. L. Blathwayt, H. J. Boyd, Col. G. A. Bridge, Mrs. M. H. Bridge, G. C. Buxton, Mrs. G. C. Buxton, Miss K. M. Cary, P. J. Chadwick, Miss G. G. Clement, G. E. Clothier, Mrs. M. L. Colthurst, D. M. Cormack, R. S. Cormack, Miss D. Crampton, R. V. Culverwell, H. H. Davis, E. E. Dunn, H. Dunnicliff, Miss P. Farmer, Mrs. H. E. Fox, Dr. G. G. Hartill, B. King, H. R. H. Lance, A. C. Leach, N. W. Moore, H. W. Neal, P. M. J. Nethercott, P. F. O'Neill, Miss E. M. Palmer, Mrs. M. Palmer-Smith, R. H. Poulding, Prof. A. G. Pugsley, W. L. Roseveare, J. H. Savory, Peter Scott, R. A. Skinner, Miss C. A. L. Wareham, H. F. Webb and M. A. Wright. Observations are followed by the appropriate initials throughout, with names of non-member contributors in full.

The area covered is that part of Gloucestershire (**G.**) lying east of the Severn and south of a line from the New Grounds to the county boundary at Tetbury, and Somerset (**S.**) north of the R. Axe from Brean Down to Wells and a line thence to the county boundary near Frome. For the purpose of this Report the area extends westward into the Channel and Estuary to include the islands of Steep Holm and the Denny (cf. Sketch Map, *Proc. B.N.S.*, 1947, p. 225).

GREAT NORTHERN DIVER *Colymbus immer*

S. Single bird, Cheddar res., various occasions, mid-Jan. to late Apr. (C. H. Fry, B.K., W.L.R.) ; one, same place, Nov. 8 (P.J.C., B.K.). Contrary to remarks in the Revised list (*Proc. B.N.S.*, 1947, p. 254), records for past ten years or so suggest that *C. immer* is more frequent than Red-throated Diver and that it occurs at the reservoirs in most winters (P.J.C., H.H.D.).

SLAVONIAN GREBE *Podiceps auritus*

S. One, perhaps two, Blagdon res., Mar. 6 (W.L.R.).

BLACK-NECKED GREBE *Podiceps nigricollis*

S. The following reported from Barrow Gurney resrs. : two, Aug. 20 (G.G.C.); three ads, Aug. 28, but only one on 30th (P.J.C.). An adult and two juveniles, same place, Sept. 3 (P.J.C.).

LITTLE GREBE *Podiceps ruficollis*

G. Adult feeding two fledged, but not fully grown, young on large pond, Northwoods, Winterbourne, as late as Oct. 18 (B.K., R.H.P.).

S. Usual autumn numbers, Blagdon res.; fifty counted Oct. 11 (B.K.).

MANX SHEARWATER *Puffinus puffinus*

G. and **S.** Four recovered alive in City area after strong south-westerly winds and sent to Clifton Zool. Gardens, Aug. 31–Sept. 5; birds subsequently released on coast but only two could take flight for the open sea (R.H.P.). One found alive, Claverton Down, Bath, late Aug., has since been successfully maintained in captivity by Mr. E. Smith, who records that the bird, fed on a diet of small fish, was still thriving in mid-Feb., 1954 (per B.K.). Remains of two, Weston-super-Mare, Sept. 7 (R.H.P.).

GANNET *Sula bassana*

G. One on Estuary, New Grounds, Sept. 23 (H.J.B.).

S. One visited Chew Magna res., Sept. 5; the bird, in starved condition, was caught next day and subsequently died (G. Lyons per G.G.C.). One found alive in field, Bleadon, after strong westerly gale, Sept. 22 (G. L. Wilson per W.L.R.).

CORMORANT *Phalacrocorax carbo*

S. Unusually high number of twelve, Cheddar res., Feb. 18 (B.K.).

HERON *Ardea cinerea*

S. Thirty-two nests in use (six less than in 1952), Brockley Combe, Apr. 25 (G.E.C., B.K.). Twenty-two nests occupied, Uphill Grange, Apr. 29 (W.L.R.). Two, perhaps three, occupied nests, Orchardleigh, nr. Frome, late May (D. James per B.K.). Bird ringed as nestling, Brockley Combe, 25/5/52, recovered, Bradford Abbas, Dorset, 14/1/53 (R.H.P.).

SPOONBILL *Platalea leucorodia*

G. One, ad., New Grounds, Oct. 11–17; the bird was usually to be seen on the sandbanks, or in company with wild geese on the saltings (S. T. Johnstone, H.H.D. *et. al.*). For previous New Grounds records see *Proc. B.N.S.*, 1945, p. 84; 1949, p. 31.

MALLARD *Anas platyrhyncha*

G. Highest total on Estuary, New Grounds, *c.*1000, late Sept.–early Oct., but only half the number, mid-Nov. (H.J.B., B.K.).

S. Max. counts, Blagdon res.: 520, Oct. 11, and 500, Nov. 27 (P.J.C., B.K.). Highest totals, Cheddar res.: 72, Feb. 15 (B.K.), and Barrow Gurney resrs.: 65, Sept. 28 (C. H. Fry). High coastal counts: 331 off Brean Down, Jan. 25 (P.J.C., R.H.P.); 253 nr. mouth of R. Yeo, same date (P. S. Bulson per B.K.); and 190, Axe Estuary, Feb. 13 (W.L.R.). About 55 on lake, Orchardleigh, nr. Frome, Aug. 22 (Miss E. D. Overend per B.K.). Two in pure white plumage, and with bright yellow bills, among normal birds, Blagdon res., various dates, Aug.–Sept.; seen on water and in flight, and behaving as if genuinely wild (P.J.C., H.H.D., C.A.L.W. *et al.*).

TEAL *Anas crecca*

S. Max. coastal counts: 750 nr. mouth of R. Yeo, Jan. 4 (P. S. Bulson per B.K.), and 210 off Brean Down on 25th (P.J.C., R.H.P.). Highest reservoir totals: *c.* 800, Blagdon, Nov. 27 (B.K.) and 220, Barrow Gurney, Dec. 28 (P.J.C.).

GARGANEY *Anas querquedula*

G. One visited the S.W.T. enclosures, New Grounds, late Sept. and remained to end of year (H.J.B.).

S. A pair, Blagdon res., Apr. 11; two pairs, same place, on 12th, but none seen afterwards (P.J.C., B.K., W.L.R.).

GADWALL *Anas strepera*

S. Single bird, mouth of the Avon, Jan. 18 (A.C.L.). Reported from Blagdon res.—a male, Aug. 30, Sept. 6; two pairs, Dec. 13; and two males and a female on 28th (P.J.C., B.K.).

WIGEON *Anas penelope*

S. Highest reservoir counts: 435, Blagdon, Feb. 15, and 481, same place, Nov. 27 (B.K.). Eighty, Yeo Estuary, Feb. 15 (W.L.R.), and 120, mouth of the Avon on 22nd (P.J.C.).

PINTAIL *Anas acuta*

S. Pair, mouth of the Avon, Feb. 22 (P.J.C.). Reported in very small numbers from reservoirs—two, Blagdon, Mar. 1, and up to three, various dates, Oct.-Dec.; two, Cheddar, Oct. 4, and single bird, Nov. 27 (P.J.C., B.K.).

SHOVELER *Spatula clypeata*

S. Twelve, Yeo Estuary, Feb. 15 (W.R.L.). The only noteworthy inland record is of 85, Blagdon res., Nov. 27 (B.K.).

RED-CRESTED POCHARD *Netta rufina*

S. One, a male in partial eclipse or immature plumage, Blagdon res., Oct. 11, had perhaps escaped from captivity;

the species is, however, extending its range westward in Europe and as considerable numbers now visit Holland in late summer and autumn, the possibility that the bird was genuinely wild cannot be ruled out (P.J.C., B.K., Miss P. Barclay-Smith).

SCAUP *Aythya marila*

S. The only record is of three off Brean Down, Dec. 14 (M.L.C.).

TUFTED DUCK *Aythya fuligula*

G. Thirty-two on Estuary, New Grounds, Feb. 15 (H.J.B.).

S. Noteworthy reservoir counts: 250, Blagdon, Nov. 27, and 69, Chew Stoke, same date (B.K.); 105, Cheddar, Dec. 13 (P.J.C., B.K.); 44, Barrow Gurney, and 30, Chew Magna, Dec. 28 (P.J.C.).

POCHARD *Aythya ferina*

G. Seventeen on Estuary, New Grounds, Feb. 15 (H.J.B.).

S. Max. reservoir totals: 616, Cheddar, Dec. 6 (B.K.) and 640 (males 480), Blagdon, on 13th (P.J.C., B.K.). Other reservoir counts included 48, Chew Stoke, Nov. 27 (B.K.) and 84, Barrow Gurney, Dec. 28 (P.J.C.).

GOLDENEYE *Bucephala clangula*

S. Twenty-six (10 ad. males), Blagdon res., Mar. 8, 22 and Apr. 12; fourteen, Cheddar res., Dec. 13 (P.J.C., B.K.).

COMMON SCOTER *Melanitta nigra*

S. Single female, Barrow Gurney resrs., Apr. 12 (G.E.C.).

EIDER *Somateria mollisima*

S. One, immature male, swimming off Steep Holm, Apr. 26 (P.J.C.). An adult female in small cove at point of Brean Down, Dec. 14 (M.L.C. *et al.*); first records for the district for more than fifty years (cf. *Proc. B.N.S.*, 1947, p. 251).

GOOSANDER *Mergus merganser*

S. Reported from Cheddar res.: three (2 ad. males), Jan. 15 (W.L.R.); five (3 ad. males), Jan. 18 (P.J.C., B.K.); and single bird, several dates to end of March (K.M.C., C.A.L.W. *et al.*).

SMEW *Mergus albellus*

S. Up to eleven (several ad. males), Blagdon res., various occasions, mid.-Jan. to mid-Mar. (G.G.C., P.J.C., C. H. Fry *et al.*); six, same place, Dec. 28 (B.K.).

SHELD DUCK *Tadorna tadorna*

G. One inland on flooded pasture, Stoke Gifford, Sept. 1 (R.H.P.). 210 on Estuary, New Grounds, Sept. 23—a high total for the date (H.J.B.).

S. Reservoir records: two Cheddar, Mar. 8, 15 (G.G.C., K.M.C. *et al.*) and single birds, Barrow Gurney, May 3 (P.J.C.); Blagdon, Aug. 9, Sept. 6 (P.J.C., R.H.P.) and Chew Stoke, Dec. 12 (D.C.). Thirteen pairs, Steep Holm, May 2 (P.J.C.). Coastal counts included 120, Yeo Estuary, Feb. 2 (P. S. Bulson per B.K.); 350, Axe Estuary, Sept. 28 (G.C.B.); 550, Weston Bay, Oct. 8 (Mrs. M. L. Butterworth per W.L.R.); and 203, Brean Sands, Dec. 15 (W.L.R.).

Greylag Goose *Anser anser*

G. Party of three, New Grounds, Dec. 22 to end of year; the birds were seldom seen in company with wild White-fronts on the saltings, being usually found on pastures alongside the S.W.T. enclosures (H.J.B., H.H.D.).

White-fronted Goose *Anser albifrons albifrons*

G. Usual large numbers, New Grounds, early in year, with record count of 4,700, Jan. 6. Gradual decrease thereafter, but 3,000 still present, Feb. 15. Main departure, Mar. 5–15; four remaining to 26th (H.J.B.). Thirty geese on Estuary on exceptionally late date of May 5 reported as White-fronts (R. Philpott per H.J.B.). First autumn arrivals—four, Sept. 20. Gradual increase to 540, late Oct.; 780, late Nov.; and 1,510, Dec. 24 (H.J.B.).

S. Forty-three on coast nr. Yeo Estuary, Jan. 4 and fourteen on 25th (P. S. Bulson per B.K.). Single bird, Barrow Gurney resrs. Jan. 18 (J.B., G.E.C.).

Greenland White-fronted Goose *Anser albifrons flavirostris*

G. Party of three (first noted previous Nov.) among typical birds, New Grounds, Jan. 2; also single adult, Jan. 4, and another, Feb. 3 (H.J.B.).

Lesser White-fronted Goose *Anser erythropus*

G. Two, ad. and imm., identified among common White-fronts, New Grounds, various dates, Jan.–Mar., were birds first reported at close of previous year. One, ad., same place, Oct. to end of Dec. (H.J.B., H.H.D., B.K. *et al.*).

Bean Goose *Anser fabalis*

G. At least five seen among White-fronts, New Grounds, in period mid-Jan. to mid-Mar. (H.J.B.).

Pink-footed Goose *Anser brachyrhynchus*

G. Four, New Grounds, Jan. 2, and single bird, mid-March (H.J.B.). First autumn arrivals, same place—six, Sept. 28, increasing to 89, Oct. 27, and 103, Nov. 4; 85 still present, Nov. 15, but only ten on 30th, and no more than three, any date in Dec. (H.J.B., H.H.D., B.K.).

DARK-BREASTED BRENT GOOSE *Branta bernicla bernicla*

G. One, New Grounds, Nov. 30 to end of year, and party of five, Dec. 7–15 (H.J.B.).

BARNACLE GOOSE *Branta leucopsis*

G. Two, ad. and imm., New Grounds, Jan. 1–Mar. 2, and a second adult, Jan. 24–Mar. 13 (H.J.B.).

BEWICK'S SWAN *Cygnus bewickii*

G. A first winter bird visited S.W.T. enclosures, New Grounds, Jan. 26 ; it remained and was subsequently caught and pinioned ; two adults visited the pens, Jan. 27, and were seen again on 29th (H.J.B.). Three swans, probably this species, overhead, same place, Feb. 4 (D. Lea per H.J.B.).

BUZZARD *Buteo buteo*

G. Seen frequently, North Nibley, where four soaring over Westridge Wood, Oct. 20 (H.F.W.). One, Dursley, Apr. 25, May 3 (D. R. Hamblett), and juv. male shot near same place, early Sept. (reported by T. P. Walsh). Single birds also seen, Tortworth, May 10 (D.M.C., R.S.C.) ; Stoke Bishop and Littleton-on-Severn, Sept. 6 (A.C.L., R.H.P.) ; Pucklechurch, Sept. 17 (D.M.C.) ; and New Grounds, Nov. 1 (R.H.P.). One killed, Old Sodbury, and sent to City Museum, early Dec. (reported by J. H. S.).

S. Again reported from many localities. Records include those of a pair with nest and eggs, Loxton, Apr. 19 (R.H.P. *et al.*) ; three together, Flax Bourton, Apr. 25, 26 (G.G.C.) ; two, Litton, May 3 (G.A.B., M.H.B.) ; two, Long Ashton, May 18, and single birds, several dates previously (G.A.B., M.H.B., G.E.C.); two nr. Brockley, Aug. 18 (H.W.N.) ; and two Rickford Coombe, Nov. 22 (P.J.C.). Frequently noted, Hutton, where local keeper saw five together in Apr., and two young being fed, July 26 (H.R.H.L., W.L.R.). One over Steep Holm, Mar. 16, Oct. 4 (H.J.B., P.J.C., R.H.P.). Records from coast of single birds, Clevedon, Sept. 14 (P.F.) and Brean Down, Dec. 15 (W.L.R.).

SPARROW HAWK *Accipiter misus*

S. One, Steep Holm, Oct. 4 ; second record only for the island (P.J.C., R.H.P.).

HEN HARRIER *Circus cyaneus*

S. Three harriers (2 males and female), almost certainly this species, Kenn Moor, May 1, 2 (A. E. Robinson per A.C.L.).

Peregrine *Falco peregrinus*

G. Two, New Grounds, Jan. 4 (P.J.C.) and one, Oct. 3, 11, Nov. 15 (H.H.D., B.K.). Single birds, Aust, May 9 (H.W.N.); Severn Beach, Sept. 19 (P.J.C.); and Avonmouth on 20th (H.W.N.).

S. Pair, Steep Holm, various dates, mid-Mar. to early June, but no direct evidence of breeding (P.J.C., C. H. Fry). Coastal reports of one, Yeo Estuary, Jan. 18, Aug. 9 (W.L.R.); two, Brean Down, Feb. 13, and single birds, various dates, Nov.-Dec. (M.L.C., W.L.R. *et al.*). Reservoir records of two fighting overhead, Litton, Aug. 9 (R.V.C.); one, Blagdon, Sept. 13 (P.J.C.); and one, Cheddar, Dec. 13 (P.J.C., B.K.).

Merlin *Falco columbarius*

G. Female, New Grounds, Jan. 2 (H.J.B., B.K.) and a male nr. Berkeley, May 10 (D.M.C., R.S.C.). One nr. Berkeley Road Station, Dec. 27 (H.J.B.).

S. A male, Sandford, Nov. 22 (C. H. Fry).

Kestrel *Falco tinnunculus*

S. Two passing Steep Holm and heading for Brean Down, Oct. 4; two on similar course, same place, on 5th (P.J.C., R.H.P.).

Red-legged Partridge *Alectoris rufa*

S. Single bird, Saltford, Apr. 27 (B.K.).

Quail *Coturnix coturnix*

G. One heard, and subsequently flushed, in grass crop, Little Stoke, June 29 (H.H.D.). Half-a-dozen or more calling birds located on outskirts of Marshfield, first three weeks of July; calling heard in various widely separated fields, several occasions, 3rd–19th (A.E.B., P.J.C., H.W.N.).

S. Calling noted in grassfield nr. Leigh Woods, May 21 (P.J.C., R.H.P.).

Water Rail *Rallus aquaticus*

G. One at Wick, first reported previous Dec., still present and seen almost daily till Mar. 19. One found dead, same locality, May 5 (D. R. Hamblett).

S. Single birds nr. Cheddar res., Mar. 29, Dec. 13 (P.J.C., B.K.), and Nailsea, July 28 (P.F.). Two heard, Barrow Gurney, Nov. 7 (R.A.S.).

Corncrake *Crex crex*

G. Dead bird, victim of overhead wires, Stoke Lodge, Patchway, Oct. 15 (H.H.D.).

S. Heard in field adjoining Cheddar res., various occasions, May 4–June 7 (B.K.). Single birds calling, Sidcot, May 30

(C. H. Fry) and near Cadbury Camp, Tickenham, on 31st (R.H.P.). Calling heard, both ends of Blagdon res., June 5 (B.K.).

OYSTERCATCHER *Haematopus ostralegus*

G. Three on Estuary, New Grounds, Aug. 13 (A. J. B. Thompson).

S. Inland records : one, Blagdon res., Apr. 23 (E.M.P.) and one or more, Sept. 3 (M.P-S.) ; one, Cheddar res., Dec. 6 (B.K.).

LAPWING *Vanellus vanellus*

More plentiful than usual during the abnormally mild weather, Nov.–Dec.

G. Flock of over 800 on arable, Mangotsfield, Dec. 24 (R.S.C., R.H.P.) and at least 1,200 on Estuary, New Grounds, on 26th (B.K.).

S. Reservoir records include those of 430, Blagdon, Nov. 27, and *c.* 500, Chew Stoke, Dec. 12 (D.C.). About 1,000, Weston airport, Dec. 4, and *c.* 1,500, Brean Sands, on 15th (W.L.R.).

RINGED PLOVER *Charadrius hiaticula*

S. Unusually large number, Blagdon res., on autumn passage ; up to 49 counted, various dates, Aug. 23–Sept. 20 (G.C.B., M.P-S., G. Boyle per B.K. *et al.*).

GREY PLOVER *Squatarola squatarola*

G. The only record is of four on Estuary, New Grounds, Nov. 1 (R.H.P.).

GOLDEN PLOVER *Pluvialis apricaria*

S. Records include those of 45 or more, Marksbury, Mar. 28, where scarce or absent in past few years (B.K.) ; 90 Lulsgate aerodrome, Dec. 13 (P.J.C., B.K.) and *c.* 40, Brean Sands on 15th (W.L.R.). One in flight over Steep Holm, Oct. 4 (P.J.C., R.H.P.).

TURNSTONE *Arenaria interpres*

G. Highest count from the Estuary—185, Severn Beach, Oct. 18 (P.J.C.).

COMMON SNIPE *Capella gallinago*

S. Unusually plentiful, Nov.–Dec. ; *c.* 150 flushed, Chew Stoke res., Nov. 28, were seen to combine into one compact flock (D.C.), while 60 were put up by B.K. on marshy ground, Cheddar res., Dec. 13.

JACK SNIPE *Lymnocryptes minimus*

G. Two, Wotton-under-Edge, Mar. 9, and one, Nov. 29 (H.F.W.).

S. One or two on marshy ground, Cheddar res., various occasions, Nov. 8–Dec. 20 (P.J.C., B.K., R.H.P.). Three, Blagdon res., Nov. 8, and one on 15th (P.J.C., B.K.).

WOODCOCK *Scolopax rusticola*

G. One, East Compton, Jan. 15 (H.W.N.) and single birds, Dursley, Feb. 14, 21, Mar. 1 (D. R. Hamblett).

S. Single birds, Hunstrete, Jan. 30 (H.W.N.); Backwell Common, Mar. 3 (G.A.B.); and Brockley Wood, Dec. 6 (A.E.B., P.J.C.).

CURLEW *Numenius arquata*

G. Flock of 130 inland, Mangotsfield, Sept. 15 (R.S.C.). Count of 270 on Estuary, Severn Beach, Sept. 17, 19 (H.D., A.C.L.).

S. About 380 on shore, Brean Down, Dec. 15 (W.L.R.).

WHIMBREL *Numenius phaeopus*

G. Fifty-three counted, Berkeley Pill, May 10 (D.M.C., R.S.C.).

S. Exceptional numbers inland, Cheddar res., first half of May; between 90 and 100 flying in to settle on reservoir track and embankment on 3rd; thirty-one, same place, on 9th (B.K.). For the only other comparable inland record for Brit. Isles see *Brit. Birds.*, XLI, p. 89; XLVI, p. 411.

BLACK-TAILED GODWIT *Limosa limosa*

G. Four in flight over Estuary, New Grounds, Aug. 13 (A. J. B. Thompson).

S. One, Blagdon res., Sept. 3 (M.P-S.). Twenty-one, Portishead, Oct. 8 (E.E.D., H.F.W.).

BAR-TAILED GODWIT *Limosa lapponica*

G. Nineteen on Estuary, May 10 (B.K.) and four, Sept. 23 (H.J.B.). Single birds, Severn Beach, May 6, Dec. 13 (H.H.D.).

GREEN SANDPIPER *Tringa ochropus*

G. Single bird, Wotton-under-Edge, Apr. 15 (E.E.D., H.F.W.). One or more, New Grounds, mid-Aug. (H. J.B., A. J. B. Thompson); two, same place, Dec. 7, and one on 31st (H.J.B.).

S. Reservoir records: one, Blagdon, Apr. 5 (B.K.) and three, Nov. 7 (C. H. Fry); one, Chew Stoke, June 28, Aug. 23 (B.K., H.H.D.) and four, Aug. 2, 16 (B.K.); one, Litton, Oct. 26 (A.C.L.). Single bird, Portishead, May 7 (E.E.D., H.F.W.).

WOOD SANDPIPER *Tringa glareola*

G. Two at north end of New Grounds, Aug. 13 (A. J. B. Thompson); one, in S.W.T. enclosures, same place, on 17th (P.S.).

S. One, Cheddar res., Aug. 9 (P.J.C., B.K., R.H.P.).

COMMON SANDPIPER *Actitis hypolencos*

S. One or two wintering birds, Cheddar res., Jan.—early Mar. (P.J.C., B.K.). One, early migrant or wintering bird, Blagdon res., Mar. 29 (P.J.C.). Single bird, Steep Holm, May 2 (P.J.C.)—second record only for the island (cf. *Rep. Som. Birds.*, 1939, p. 32).

SPOTTED REDSHANK *Tringa erythropus*

S. One, ad. in partial breeding dress, Blagdon res., Aug. 23–30 or later (P.J.C., H.H.D., G. Boyle per B.K.); single bird, same place, Oct. 4 (G.C.B.).

GREENSHANK *Tringa nebularia*

G. New Grounds: one, Aug. 13 (A. J. B. Thompson); two, Sept. 25 (H.J.B.); one, Oct. 18 (H.H.D.); and two, evidently wintering, Dec. 25 (H.J.B.). One, Berkeley Pill, Sept. 6 (R.H.P.).

S. Single bird, Blagdon res., Aug. 9 (G.C.B.); one, perhaps wintering, same place, Nov. 27, was unfortunately shot a few days later (B.K.).

KNOT *Calidris canutus*

G. One found dead in garden, Coombe Dingle, Mar. 11, and sent to City Museum (Prof. Bruce Perry per H.H.D.). Several, Severn Beach, May 3 (G.G.C., K.M.C., C.A.L.W.) and flock of *c.* 120 in flight, same place, Sept. 13 (H.H.D.).

PURPLE SANDPIPER *Calidris maritima*

G. Six in company with Turnstones, Severn Beach, Dec. 13 (H.H.D.).

LITTLE STINT *Calidris minuta*

G. Single bird, Severn Beach, Sept. 5, 19 (P.J.C.).

S. One, Barrow Gurney resrs., Sept. 6 (G.E.C.); another, Sept. 10, 11 (G.E.C., H.H.D., *et al.*). One, Blagdon res., Sept. 6, 13 (G.C.B., P.J.C., B.K.); four with Ringed Plover and Dunlin, same place, on 20th (H.H.D.).

DUNLIN *Calidris alpina*

S. Four, Cheddar res., Apr. 12, 26 and two, May 24 (B.K.). Up to 17 or more, Blagdon res., various dates, Aug. 23–Sept. 20 (G.C.B., M.P-S., C.A.L.W. *et al.*).

CURLEW SANDPIPER *Calidris testacea*

G. Immature bird with Dunlin, Severn Beach, Sept. 13 (H.H.D.).

S. Twice reported from Blagdon res.—one, immature, Sept. 5

(G. Boyle per B.K.) and one, perhaps the same, on 19th (G.G.C., C.A.L.W.). Only two previous inland records (H.H.D.).

RUFF *Philomachus pugnax*

G. Exceptional numbers reported from the Estuary, New Grounds, on autumn passage—some remaining well into winter. Thirty-two counted, Sept. 20 (P.J.C., B.K.) and 23 on 23rd (H.J.B.); subsequent reports of six, Oct. 11; four, Nov. 1; seven, Nov. 30; and four, Dec. 7, 26 (H.J.B., H.H.D., B.K.).

S. One, Blagdon res., Sept. 5 (G. Boyle per B.K.) and two on 6th (G.G.C., C.A.L.W.).

GREY PHALAROPE *Phalaropus fulicarius*

S. Single birds, Barrow Gurney resrs., Sept. 24–28 (G.E.C., G.G.C., H.H.D., *et al.*); Cheddar res., Nov. 5 (R. E. Jones per B.K.); and Chew Stoke res., on 15th (G.C.B.).

LESSER BLACK-BACKED GULL *Larus fuscus*

G. and **S.** Twenty-seven counted on Avon between docks and river-mouth, Dec. 13 (R.H.P.).

HERRING GULL *Larus argentatus*

S. Two ringed as fledglings, Steep Holm, 18/6/50 and 10/7/52, recovered, Brighton, 21/11/53, and nr. Dol, Brittany, 8/1/53, respectively (R.H.P.).

COMMON GULL *Larus canus*

G. New Grounds: three organised counts of birds flying in to roost on sand-banks showed the following results:—

Jan. 4, *c.* 10,500 (H.J.B., P.J.C., B.K., H.W.N., R.H.P.).
Nov. 1, *c.* 24,750 (G.E.C., P.J.C., B.K., R.H.P.).
Dec. 5, *c.* 10,075 (H.J.B., G.E.C., B.K., R.H.P.).

One recovered, Berkeley, 26/10/52, ringed as fledgling, Vestfold, Southern Norway, 14/6/52.

LITTLE GULL *Larus minutus*

S. First-winter bird, Barrow Gurney resrs., Sept. 10–26 (G.E.C., G.G.C., H.H.D., *et al.*).

BLACK-HEADED GULL *Larus ridibundus*

S. About 15,000 counted flying in to roost on mud-banks, mouth of Avon, Jan. 11 (G.C.B., R.H.P.).

KITTIWAKE *Rissa tridactyla*

S. Second year bird, evidently ailing or exhausted, Cheddar res., July 4 (C. H. Fry).

BLACK TERN *Chlidonias niger*

G. Two over Estuary, New Grounds, Aug. 13 (A. J. B. Thompson).

S. Reported from reservoirs on autumn passage only—two, Blagdon, Aug. 9 (B.K.); up to four, Barrow Gurney, various dates Sept. 6–25 (G.E.C., G.G.C., P.J.C.); and one, Cheddar, Sept. 27 (C. H. Fry).

COMMON TERN *Sterna hirundo* ARCTIC TERN *Sterna macrura*

S. One spring record—that of a single Common, Cheddar res., Apr. 12 (P.J.C., B.K.). Noted at reservoirs in small numbers (max. thirteen), various occasions, Aug. 9–Oct. 4, the only definite identifications (all of Commons) being those of two, Cheddar, Aug. 9; five, same place, and several, Blagdon, Sept. 27 (P.J.C., B.K., R.H.P.). Two in Channel, off Clevedon, Sept. 6 (P.F.).

LITTLE TERN *Sterna albifrons*

S. One, Cheddar res., Apr. 12 (P.J.C., B.K.); immature bird, same place, Sept. 27 (C. H. Fry, B.K.).

SANDWICH TERN *Sterna sandvicensis*

S. Single birds, Blagdon res., Mar. 28, Apr. 5, 12 (P.J.C., B.K.).

LITTLE AUK *Alle alle*

G. One in Estuary below Aust Cliff, Oct. 4 (R.V.C.).

HOOPOE *Upupa epops*

G. One disturbed from pavement and afterwards seen in trees, Cotham Park, Bristol, Apr. 24 (J. R. Hims per H.H.D.); observer reported that the bird's wing pattern reminded him of a "zebra crossing".

S. One visited the premises and adjoining fields, Portishead Brick Works, on autumn passage and remained more than a fortnight; first noted Aug. 19 (R. Welsh per H.H.D.), and subsequently seen on various dates to Sept. 5 (K.M.C., P.J.C., H.H.D., A.C.L.).

LESSER SPOTTED WOODPECKER *Dryobates minor*

G. Breeding reported from North Nibley, where ad. and juv. seen in beech tree, June 10 (H.F.W.). One, Almondsbury, May 2, and Tockington, Nov. 22 (A.E.B.).

S. Single birds, Blagdon res., Mar. 8 (P.J.C., B.K.); nr. Backwell, early summer (G.A.B.); and Saltford, July 5 (B.K.).

WOOD LARK *Lullula arborea*

G. Frequently noted, Dursley, where seven, including three singing males, seen, Mar. 8; pair, with newly fledged young, same place, June 6 (D. R. Hamblett). Also seen, North Nibley area, various dates, Mar.–Dec. (E.E.D., H.F.W.).

S. Breeding season records: two in song, Hutton, Mar. 10, 18 (H.R.H.L.); a pair, Sidcot, frequently (C. H. Fry); and single birds, Nordrach-on-Mendip, Apr. 6 (A.E.B.) and Cheddar, May 12 (B.K.).

RAVEN *Corvus corax*

S. Bred successfully Brean Down, three young reared (W.L.R.); nr. Sand Point, four young reared (A.E.B.); and Steep Holm, where two fledged young seen, Apr. 25 (P.J.C.). Single birds, Hutton, Jan. 20, May 3 (W.L.R.); Clevedon, Dec. 13 (H.R.H.L.); and Hinton Blewett on 27th (R.A.S.).

CARRION CROW *Corvus corone*

G. and **S.** The following large counts reported: 77 on mudbanks, Avon Gorge, July 4 (W.L.R.), and record total for the locality of 167, Sewage Farm, Saltford, Dec. 25 (B.K.).

JACKDAW *Corvus monedula*

S. One recovered, London Colney, Herts., in April had been ringed, Long Ashton, July, 1950 (G.E.C.).

GREAT TIT *Parus major*

S. Probably occurs, Steep Holm, more frequently than records suggest; single birds on the island, Mar. 14, 16, and Oct. 6 (P.J.C., R.H.P.).

BLUE TIT *Parus caeruleus*

S. Three, Steep Holm, Mar. 15, and at least five on 16th; not seen on visits, Apr.–May, but one noted, Oct. 6 (P.J.C., R.H.P.).

DIPPER *Cinclus cinclus*

S. Frequently seen, Stanton Drew and Publow, but no evidence of breeding (G.C.B.). One at waterfall behind Cliff Hotel, Cheddar, Dec. 13 (A.G.P.).

RING OUZEL *Turdus torquatus*

G. Single female, nr. Dursley, Apr. 25, 26, and a male, Stinchcombe Hill, Sept. 26 (D. R. Hamblett).

BLACKBIRD *Turdus merula*

G. Nest with four eggs, Woodlands, Almondsbury, just previous to Dec. 25 (per A.E.B.).

WHEATEAR *Oenanthe oenanthe*

S. Three pairs bred (two successfully) on high ground nr. Compton Bishop (P.J.M.N.). Despite frequent search in suitable Mendip areas, this is the first conclusive nesting information for recent years.

BLACK REDSTART *Phoenicurus ochrurus*

S. Single, female or immature, birds reported from Brean Sands, Jan. 25 (P.J.C., R.H.P.) ; Keynsham, Nov. 11 (B.K.) ; Brean Down, Dec. 15 (W.L.R.) ; Uphill, Dec. 28 (H.R.H.L.) ; and Middle Hope, Woodspring on 31st (W.L.R.). Up to four, females or immatures, Long Ashton Research Station, late Oct. —early Nov. (G.E.C., M.A.W.).

ROBIN *Erithacus rubecula*

S. Two, Steep Holm, Mar. 14–17 ; none found on the island, Apr.–May, but at least twelve seen and heard, Oct. 3–6 (P.J.C., R.H.P.).

WHITETHROAT *Sylvia communis*

G. One trapped and ringed, Mangotsfield, on exceptionally late date of Nov. 16 (D.M.C., R.S.C.).

CHIFFCHAFF *Phylloscopus collybita*

S. Two, perhaps three, Blagdon res., Feb. 15, were evidently wintering birds ; one still present, Feb. 22, Mar. 1 (P.J.C., B.K.).

WOOD WARBLER *Phylloscopus sibilatrix*

S. One ringed as nestling, Leigh Woods, June 16, shot Pescara, on Adriatic coast of Italy, Sept. 1 (P.J.C.).

GOLDCREST *Regulus regulus*

S. Seen on Steep Holm (single bird, Oct. 5, 6) for third successive year (P.J.C., R.H.P.).

PIED FLYCATCHER *Muscicapa hypoleuca*

G. Single males, Coombe Dingle, Apr. 12 (H.W.N.) ; Swangrove, Badminton, Apr. 13 (G.G.H.) ; Little Stoke, Apr. 21 (H.H.D.) ; and Durdham Down, Clifton, on 27th (S.H.G.B.). A pair, Bowcott Wood, North Nibley, Apr. 20 (E.E.D., H.F.W.). Female, Almondsbury, May 2 (A.E.B.).

S. Single males, Portishead, Apr. 12 (P.F.O'N.) and Winford, on 15th (H.E.F.). A male, Leigh Woods, Apr. 14, 15, and two on 21st (P.J.C., R.S.C.).

MEADOW PIPIT *Anthus pratensis*

G. Two nests found, Stinchcombe Hill ; first breeding record for this locality (D. R. Hamblett).

RED-BACKED SHRIKE *Lanius collurio*

S. Male, Ashton Gate area, May 12, but no evidence of breeding (P.J.C.). Pair, Cheddar res., May 12 (B.K.). Three on coast, Charlcombe Bay, July 4 (H. S. Semple per B.K.).

STARLING *Sturnus vulgaris*

G. Several thousand roosting, High Wood, adjoining Filton by-pass, from mid-Aug. ; increase to at least 20,000 by mid-Oct., the birds finally moving to small plantation close by the aerodrome runway (H.D., H.H.D.).

S. A bird recovered nr. Zeebrugge, Belgium, Nov. 15, had been ringed, Long Ashton, in previous Dec. (G.E.C.).

CROSSBILL *Loxia curvirostra*

G. One, Wick, Sept. 23 (D. R. Hamblett). Up to 16 in apple orchard, Cowhill, Oldbury-on-Severn, various dates, late Oct.–mid-Nov. ; last seen, party of five including four red birds, Nov. 18 (T. Jones per H.D., H.H.D.).

S. One in conifers, Blagdon res., Dec. 13 (P.J.C., B.K.).

CORN BUNTING *Emberiza calandra*

G. Single males in song, Symonds Hall Farm, nr. Ozleworth, Apr. 19 (D. R. Hamblett) ; Hambrook, Apr. 24, 25 (R.H.P.) ; Mangotsfield, Apr. 27 (R.H.P.)—about half a mile from small colony where at least six singing males present throughout nesting season (D.M.C., R.S.C.) ; and Leighterton, June 8 (D. R. Hamblett). Two males in song, Hawkesbury Upton, Aug. 5 (H.F.W.).

S. Perhaps bred, Saltford area, where male seen, May 11 (B.K.) and a pair noted, June 26 (P.J.C.).

CIRL BUNTING *Emberiza cirlus*

G. Breeding season records from Clifton and Westbury-on-Trym (A.C.L.) ; Henbury (H.H.D.) ; and Sea Mills (R.H.P.).

S. Pair reared young, Portishead (P.F.O'N.). Other breeding season reports are of single birds, Cheddar, Apr. 12 (B.K.) and nr. Cadbury Camp, May 31 (R.H.P.).

SNOW BUNTING *Plectrophenax nivalis*

S. Single male, Sand Point, Nov. 6 (N.W.M.).

LEPIDOPTERA NOTES BRISTOL DISTRICT, 1953

By C. S. H. Blathwayt, M.A., F.R.E.S.,
Hon. Sec. of the Entomological Section

(*Received, Jan. 22, 1954. Read in title to Council, Feb. 25, 1954.*)

THE months of January and February were on the whole rather cold, but the weather showed some improvement in March, particularly at the end of the month. April was not a good month and was rather wet and cold but the month of May was much better and there was some exceedingly hot weather over Whitsun. After a cold beginning June was on the whole fine and warm but was followed by a very wet and cold July. The first half of August was very fine and hot but the latter part of the month was cloudy and rather wet. Most of September was comparatively fine, though there were some very severe gales at the end of the month. October, as has been the case in recent years, was a fine month and the year concluded with an unusually mild November and December.

On the whole the year was a moderate one so far as the Lepidoptera were concerned.

I am most grateful to Messrs. C. L. Bell (C.L.B.), G. H. W. Cruttwell (G.H.W.C.), H. S. Damsell (H.S.D.), Dr. G. Hartill (G.H.) and the late Dr. J. A. Walker (J.A.W.) for sending me their Records, some of which are included below with a selection from my own Records (C.S.H.B.).

Gonepteryx rhamni Linn. (Brimstone). First seen Feb. 26 at Yate (G.H.), last seen at Badminton, Nov. 9 (G.H.).

Argynnis paphia Linn (Silver-washed Fritillary). 3 Var *Valezina* taken in fresh condition, July 18, North Somerset (C.L.B.).

Euphydryas aurinia Rott. (Marsh Fritillary). First imago seen at new colony near Bristol on May 12. This colony was established in 1952 by C.L.B. and over 50 were counted in late May, 1953. Females were seen to deposit on the Scabious (C.L.B.).

Aglais urticae Linn. (Small Tortoisehell). Both broods common in Bristol District (C.L.B.). Countless thousands at Weston on Sept. 6 and abundant in September (C.S.H.B.). Last seen at Chipping Sodbury on Nov. 25. (G.H.).

Limenitis camilla Linn. (*sibylla* Linn.) (White Admiral). Larvae found in South Gloucestershire May 10 (C.L.B.)

Nymphalis io Linn. (Peacock). Last seen Dec. 23 in Bristol (C.L.B.).

Acherontia atropos Linn. (Death's-head Hawk). One at light, Weston, May 24 and another reported from Locking later in the month (C.S.H.B.).

Cerura furcula Linn. (Sallow Kitten). One on Aug. 7 and two on Aug. 12, at light, Nailsea (J.A.W.).

Stauropus fagi Linn. (Lobster Prominent). Several at Nailsea (J.A.W.), at Weston (C.S.H.B.), and at Frome (G.H.W.C.) at end of June at light.

Notodonta anceps Goeze (*trepida* Esp.) (Great Prominent). Brockley at light May 6 (H.S.D.).

Clostera curtula Linn. (Large Chocolate-tip). Bristol at light, May 25 (H.S.D.)

Tethea ocularis Linn. (*octogesima* Hubn.) (Figure of Eight). Two at light in June at Nailsea (J.A.W.), Frome (G.H.W.C.).

Lymantria monacha Linn. (Black-arched Tussock). At light, Nailsea, July 31 (J.A.W.).

Trichiura crataegi Linn. (Pale Eggar). Frome (G.H.W.C.).

Drepana cultraria Fabr. (Barred Hook-tip). Brockley at light, Aug. 8 (H.S.D.).

Pseudoips bicolorana Fuessl. (*quercana* Schiff.) (Scarce Silver-lines). Several at light at Weston in early August (C.S.H.B.), Brockley, Aug. 6 (H.S.D.).

Spilosoma urticae Esp. (Water Ermine). At light, Nailsea, June 26 (J.A.W.).

Apatele leporina Linn. (Miller). Two at light, Nailsea, June 29 and July 10 (J.A.W.), Bristol, June 7 (H.S.D.).

Apatele alni Linn. (Alder Dagger). Several at light, Weston, late May and early June (C.S.H.B.).

Agrotis cinerea Hubn. (Light Feathered Rustic). At light, Weston, June 23 (C.S.H.B.).

Agrotis trux Hubn. (*lunigera* Steph.) (Crescent Dart.). At light, Weston, July 18 and Aug. 6 (C.S.H.B.).

Amathes agathina Dup. (Heath Rustic). Aug. 26 and Sept. 10, Mendip Hills (C.S.H.B.).

Amathes glareosa Esp. (Autumnal Rustic). Sept. 7 and 9, four altogether, Nailsea, at light (J.A.W.).

Anaplectoides prasina Fabr. (Green-arches). Brockley, at light, June 21 (H.S.D.).

Triphaena interjecta Hubn. (Least Yellow-underwing). Aug. 1, Mendip Hills (C.S.H.B.).

Heliophobus albicolon Hubn. (White Colon). June 6, North Somerset Coast (C.S.H.B.).

Hadena suasa Schiff. (*dissimilis* Knoch) (Dog's-tooth). Bristol, at light, Aug. 14 (H.S.D.).

Heliophobus saponariae Esp. (*reticulata*) Vill. (Bordered Gothic). Frome (G.H.W.C.).

Procus literosa Haw. (Rosy Minor). Late July and August, North Somerset Coast (C.S.H.B.), Nailsea (J.A.W.), and Frome (G.H.W.C.).

Apamea anceps Hubn. (*sordida* Borkh.) (Large Nutmeg). Several in June at light, Nailsea (J.A.W.), Bristol, June 6 (H.S.D.).

Apamea unanimis Hubn. (Small Clouded Brindle). One, North Somerset Coast, June 13 (C.S.H.B.).

Nonagria sparganii Esp. (Webb's Wainscot). Common North Somerset Coast late July and early August (C.S.H.B.).

Leucania straminea Treits. (Southern Wainscot). Common North Somerset Coast, June 27 (C.S.H.B.).

Leucania pudorina Schiff. (*impudens* Hubn.) (Striped Wainscot). Common near Clevedon, June 20 (C.S.H.B.), Leigh Woods at light, July 14 (H.S.D.).

Leucania littoralis Curt. (Shore Wainscot). North Somerset Coast, June 27 (C.S.H.B.).

Caradrina ambigua Fabr. (Vine's Wainscot). Frome (G.H.W.C.).

Laphygma exigua Hubn. (Small Mottled Willow). One at Nailsea, June 10 (J.A.W.) one at Weston, Aug. 1 (C.S.H.B.), both at light.

Cosmia pyralina View. (Lunar-spotted Pinion). Frome (G.H.W.C.).

Cosmia diffinis Linn. (White-spotted Pinion). Frome (G.H.W.C.).

Zenobia subtusa Fabr. (Olive Kidney). Larvae near Clevedon, May 30, moths emerged late July (C.S.H.B.), at light Nailsea, July 31 and Aug. 7 (J.A.W.).

Orthosia populeti Treits. (Lead-coloured Drab). Several at sallow near Clevedon at end of March (C.S.H.B.).

Orthosia advena Schiff. (*opima* Hubn.) (Northern Drab). At light, Nailsea, on March 23, and Apr. 22 (J.A.W.), Frome (G.H.W.C.).

Dasycampa rubiginea Fabr. (Dotted Chestnut). At light, Nailsea, May 5 (J.A.W.), at Ivy Weston, Oct. 30 (C.S.H.B.).

Lithophane semibrunnea Haw. (Tawny Pinion). At Ivy, Weston, Oct. 22 (C.S.H.B.).

Lithophane socia Rott. (Pale Pinion). Common at Ivy Weston, Oct.-Nov. (C.S.H.B.).

Xylena vetusta Hubn. (Red Sword-grass). A few at Ivy Weston late Oct. to early Nov. (C.S.H.B.).

Cucullia chamomillae Schiff. (Chamomile Shark). At light, Weston, Apr. 8 (C.S.H.B.).

Plusia iota Linn. (Plain Golden Y). Common at light, Nailsea, June and July (J.A.W.).

Herminia barbalis Clerck (Common Fanfoot). At light, Nailsea, July 9 and 10 (J.A.W.).

Brephos notha Hubn. (Light Orange-underwing). Common near Clevedon, Apr. 3 and 7 (C.S.H.B.).

Lobophora halterata Hufn. (Large Seraphim). Near Clevedon, May 30 (C.S.H.B.).

Calocalpe cervinalis Scop. (*certata* Hubn.) (Scarce Tissue). At light, Nailsea, May 3 (J.A.W.), Weston, May 24 (C.S.H.B.).

Colostygia multistrigaria Haw. (Grey Mottled Carpet). Abundant Mendip Hills Apr. 18 (C.S.H.B.).

Discoloxia blomeri Curt. (Blomer's Rivulet). Common at light, Weston, in June (C.S.H.B.), Frome (G.H.W.C.), Cadbury Camp, Aug. 2 (H.S.D.).

Euphyia unangulata Haw. (Sharp-angled Carpet). Several at light, Nailsea, in late July (J.A.W.), Weston (C.S.H.B.).

Eupithecia expallidata Doubl. (Bleached Pug). At light, Weston, Aug. 3 (C.S.H.B.).

Eupithecia jasioneata Crewe (Sheep's-bit Pug). Several North Somerset Coast, June 6 (C.S.H.B.).

Eupithecia satyrata Hubn. (Satyr Pug). At light, Nailsea, May 18, June 6 (J.A.W.).

Semiothisa alternaria Hubn. (Sharp Peacock Angle.) North Somerset Coast, June 6 and 13 and Aug. 8 (C.S.H.B.).

Margaronia unionalis Hubn. (Scarce Olive-tree Pearl). One at light, Sept. 5, Nailsea (J.A.W.).

Evergestis straminalis Hubn. (*stramentalis* Hubn.) (Chequered Straw Pearl). One at light, Aug. 7, Nailsea (J.A.W.).

ON THE DISPERSAL OF ODONATA

By N. W. Moore

(*Read in title to Council, Feb. 25, 1954. Received, March 10, 1954*)

Introduction

VERY little is known about the dispersal movements of Odonata. Some species make mass migrations ; practically nothing is known about the factors which cause migration or those which direct it ; nor is it clear to what extent colonisation of new breeding places results from it. In the species which do not migrate *en masse* (the vast majority) it is not known whether dispersal occurs as the result of inconspicuous migration by individuals or small parties of insects, or is due to more or less random wandering. Observations suggest that in all species there are several types of dispersal behaviour and that dispersal, including migration, occurs both in the pre-reproductive and reproductive stages of the imago, but which type of dispersal behaviour is biologically the most important is not known.

Dispersal is worth investigating for its own sake and also for its bearing on other ecological problems. For example, the recapture method of estimating population changes cannot be relied upon unless the population is shown to be a closed one, and this cannot be done without first investigating the dispersal behaviour of the species studied.

The only effective method of studying dispersal is by recording the movements of marked animals. Owing to the difficulty of marking enough insects, and of making observations over a large enough area this is often impracticable ; other methods must also be used. Examples are described in this paper. First, dispersal behaviour must be considered in relation to the total behaviour of the insects studied : it must be shown which of the known types of behaviour which involve flight, could result in dispersal.

I am indebted to Professor J. E. Harris from whose department much of the work was done, and to the many other zoologists with whom I have discussed this problem.

I.—The Activities which result in Dispersal

Larvae in land locked waters cannot disperse to areas outside them, but dispersal by larvae within one river system may occur : it has not yet been demonstrated. The imago must be the main dispersal stage, as in most insects. The first part of imaginal life, the pre-reproductive, appears to last from about 7 to about 15 days (Borror 1934, Corbet 1952, Moore, unpublished) and is spent away from water. The reproductive part may last up to about 30 days (Borror 1934, Corbet 1952, Moore 1952b). When the weather is bad this is also spent away from water, but when it is fine the males of most species spend the late morning and early afternoon by water and females make short visits to their breeding areas at that time (Moore 1953). By making many observations on Odonata, by water, and away from it, at all times of the day and under different weather conditions, it is possible to assign any given flight to one of the following categories with a high degree of certainty.

1. Search for food (often indistinguishable from 3).
2. Flight to food.
3. Search for mate (often indistinguishable from 1).
4. Flight to mate (several types are distinguishable).
5. Search for oviposition place.
6. Flight to sunning place or look-out place.
7. Flight to shelter* (sometimes same as 10).
8. Flight from enemy.
9. Flight to breeding area*.
10. Flight to roost*.
11. Flight from water at emergence.
12. Migration flight.

Observations show that the distances involved in categories 1–10 depend largely on local topography, but that they very rarely exceed 200 yards ; for example in a four year study the longest recorded flights between breeding place and roost were about 400 yards. These were made by the dragonfly *Sympetrum striolatum*. On the other hand Odonata which have just emerged have sometimes been seen with binoculars to fly until out of sight, and migration clearly involves flights over many miles.

To summarise,

(*a*) Some dispersal results from emergence flights and migration.

(*b*) The other activities of Odonata, taken singly (e.g. one food flight) involve such short flights that they cannot lead to a significant amount of dispersal.

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* As in the case of feeding and sexual behaviour the " search for " can sometimes be distinguished from the " flight to ".

II.—Methods of studying dispersal in Odonata

In this section various methods of studying dispersal in Odonata are described. Examples are given, which also provide data for the discussion.

1. *Direct observation :*

Unless used by a large team of observers this method has obvious limitations. The writer has found it useful for recording the slow and usually short flights made by dragonflies after emergence. Table I gives some figures obtained by the Portbury River near Portishead from 1949–53. It will be seen that of the 50 flights recorded none was certainly longer than 200 yards, although two may have been. But on fairly numerous occasions elsewhere, Odonata (particularly Zygoptera) have been watched flying for much greater distances, usually until out of sight. The great variation in distance flown after emergence probably depends largely on the strength of convection currents and wind. What little is known about dragonfly migration is the result of direct observation. The present writer has watched only one ; Libellulids flying east along the shore at the mouth of the Gambia river near Bathurst, West Africa, at sunset, 9th September 1948. In this case flight direction was easily recorded, but identification was exceedingly difficult : the light was bad and the insects were flying too high to be caught with a net. Although shooting with dust shot proved a successful method on several occasions, on this it failed to produce a specimen, and the species remained unidentified.

TABLE I

The numerals in columns 3–5 give the horizontal distance in yards between emergence site and the first perch after flying.

Species	No. of records	Shortest	Longest	Notes
Brachytron pratense	7	15	200	
Libellula depressa	2	28	80	
Libellula quadrimaculata	23	2	75+	Av. 20
Orthetrum cancellatum	4	1	100+	
Sympetrum striolatum	14	0	200	Av. 30

A good pair of binoculars is of course essential for direct observation.

2. *Marking :*

The experiments in which colour marking has been used on Odonata were not designed to study dispersal, but some incidental information about it was obtained. Of the 850 *Argia moesta*

(Zygoptera) marked by Borror (1934) none was recorded more than 300 yards from the place where they were marked. Corbet (1952) marked 828 *Pyrrhosoma nymphula* (Zygoptera) by a small pond in Berkshire. There was only one other suitable breeding place within a mile—no marked insects were seen there. Moore 1952a and unpublished data) marked over 100 *Anisoptera* in Somerset—the distance between the place of recapture and that of marking was never more than about 600 yards. It would be most dangerous to draw any conclusions from these records, but they suggest that under certain circumstances little dispersal may occur, and that worth while marking experiments would involve a team of observers working simultaneously over a large tract of country and that thousands of insects would have to be marked. Less ambitious pilot experiments might however produce valuable results.

Indian ink, cellulose paint and oil paint were used in the work described above with fair success (Moore 1952a).

3. *Indirect Methods :*

Owing to the difficulties described above indirect methods for measuring distances travelled etc. have to be used in default of better methods. At best they are merely suggestive :

(*a*) By recording the colonisation of a new breeding area (e.g. a reservoir) and measuring the distance between it and the nearest breeding areas, minimal distances of dispersal can be obtained, and a rough indication of the scale of dispersal can be got by noting the rate of colonisation. This method involves a very thorough knowledge of the *Odonata* fauna in the surrounding district. Two examples are given from East Sussex.

Within 6,000 yards of Great Sanders Reservoir, Sedlescombe, there breed 21 species of Odonata. Only 15 have succeeded in colonising the reservoir. Seven years after the reservoir was first full of water* at least 8 species occurred there ; twelve years after filling there were 14 species.

Twenty-one (possibly 22) species of Odonata breed within 7,500 yards of Darwell Reservoir, Mountfield. By 1947, that is within two years of being first filled and two years before filling was completed, 8 species occurred there ; after eight years there were 10 species.

Many of the species at both reservoirs had to travel less than a mile. But two (*Libellula quadrimaculata* and *Orthetrum cancellatum*) must have colonised Darwell Reservoir from places at least 7,000 yards away within 2 years.

Figures of this sort can only give a very rough indication of the extent of dispersal movements. It must be remembered that for the first year or two a reservoir is an unsuitable habitat for many of the species which later colonise it. It is possible that the increase of species found at a new reservoir reflects ecological change rather than the cumulative effect of dispersal.

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* Reservoir first filled in 1934.

(*b*) By recording the sudden appearance of a new species at an area whose normal breeding fauna is known and measuring the distance between this area and the nearest breeding place of the new species, similar information to that recorded in (*a*) is obtained. This method also involves a thorough knowledge of the distribution of *Odonata* in the neighbourhood.

The results obtained in areas studied by the writer are given in Table II. The scarcity of occurrences of this type may be due either to habitat selection behaviour, or to the new species flying away when it finds none of its own kind at the newly discovered water. Successful colonisation did not result from any of the visits recorded in Table II.

TABLE II

OCCURRENCES OF ODONATA AT BODIES OF WATER AT WHICH THEY DO NOT NORMALLY BREED

Stoke Bishop Pond = S Bristol	Ducks Hall Shaw Pond = D Whatlington, Sussex	Portbury River = P Portishead, Somerset

Species, with sex and number	Date	Body of water	Distance in yards from breeding area: nearest possible	Distance in yards from breeding area: nearest known
Agrion splendens				
1 female	5.7.52	S	2,100	7,300
Lestes dryas				
1–2 males 2–3 females	14 & 18 6.42	D	1,700	3,000 possibly 2,100
Enallagma cyathigerum ..				
pair *in coitu*	29.6.42	D	3,000	3,000
Libellula quadrimaculata ..				
1 ? male .. .. 1 ? female	28.6.49 9.7.49	S	2,100	10,200
Orthetrum cancellatum ..				
1 female	19.6.50	S	2,100	10,700
Orthotetrum coerulescens ..				
1 male	12.7.49	P	? 10 miles	40 miles
Sympetrum sanguineum ..				
1 male	1.8.51	S	2,100	10,700
Cordulia aenea				
1 female	8.6.53	S	2,100	16 miles

(*c*) Another method is to record the positions of *Odonata* found away from water and measure the distance between them and the nearest possible breeding areas. In most of Britain bodies of water are so numerous that this method like (*a*) and (*b*) gives very imprecise information, but in areas where the number of possible breeding places is limited more valuable information is obtained.

The Isles of Scilly, Cornwall, were found to be suitable for an investigation of this kind. They were visited from July 25th to August 5th 1952.

Only two species of *Odonata* occur in the Isles of Scilly : *Sympetrum striolatum* and *Ischnura elegans.* They are abundant in most of the few places where they breed. Their breeding distribution is shown on the map, Fig. 1, their relative abundance at their breeding areas is given in Table III.

TABLE III

BREEDING LOCALITIES OF ODONATA IN THE ISLES OF SCILLY 1952

Locality	Number on map	Dates visited	Abundance of *S. striolatum*	Abundance of *I. elegans*	Whether breeding
Porth Hellick Pool, St. Marys.	1	26.7.52	Abundant	Abundant	Both species
Marsh near Old Town, St. Marys.	2	30.7.52	1	None	Doubtful
Great Pool, Tresco	3	29.7.52 & 1.8.52	Abundant	Abundant	Both species
Abbey Pool, Tresco	4	29.7.52 & 1.8.52	1–2	Few	Doubtful
Great Pool, St. Agnes	5	27.7.52	Common	Abundant	Both species

No dragonflies were seen by or near the small roadside pond near Newford, St. Marys (6 on map 1) on 2.8.52 but it is quite likely that both species do occur there and by two other small ponds nearby. No dragonflies were seen by the brackish water pool (7 on map) on Bryher on 31.7.52, nor by the much polluted duck pond (8 on map) near Higher Town, St. Martins. It is most unlikely that dragonflies breed at either.

Extensive search was made for *Odonata* on all the main islands—the principal areas not covered were the N.W. part of St. Martins, the extreme west part of St. Agnes, the southern half of Gugh, Samson, and Annet (Fig. 1). The places where dragonflies were seen away from water are shown on Map, Fig. 1. The information obtained from these records is summarised in Table IV. These figures are minimal since they take into account all possible breeding areas. It is possible that all the dragonflies recorded away from water on St. Mary's came from the Porth Hellick pool, if not from other ponds on other islands : the immature insect seen in the

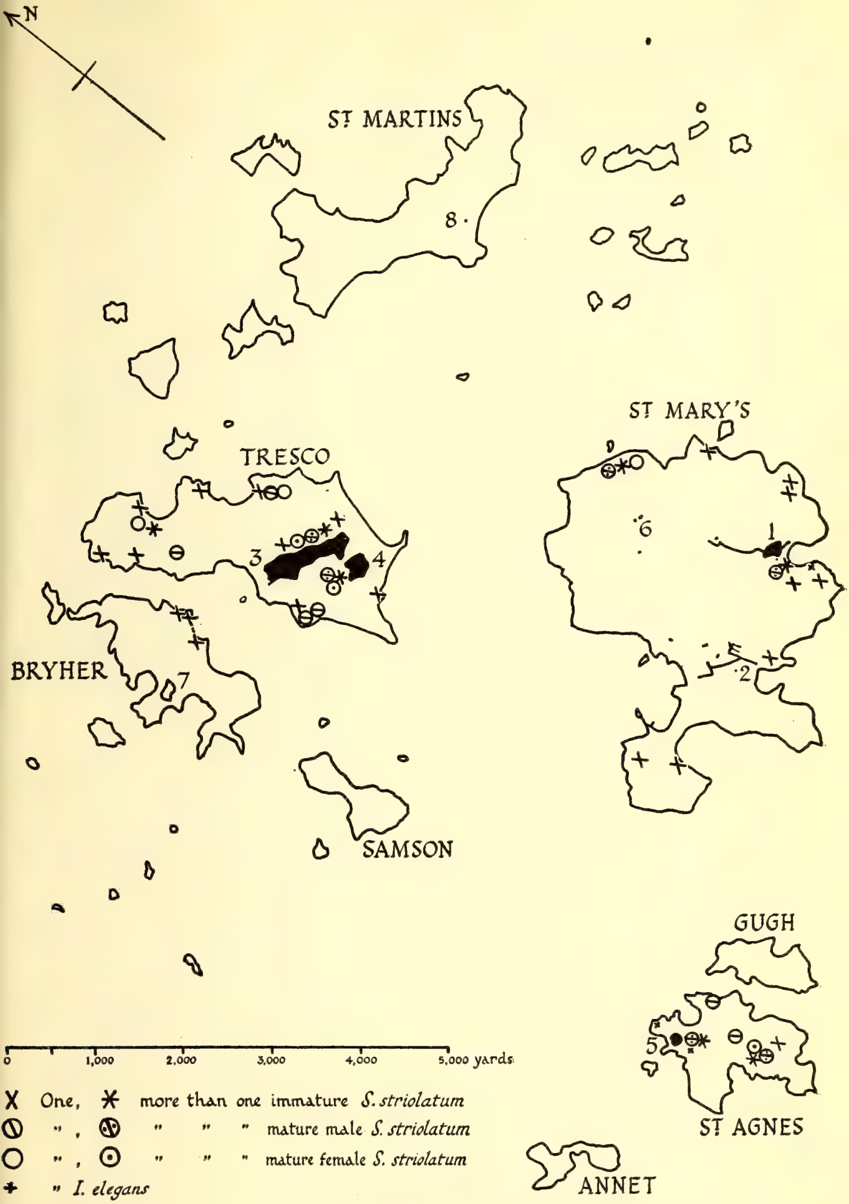
N
ST MARTINS
8
TRESCO
3
4
ST MARY'S
1
6
2
BRYHER
7
SAMSON
GUGH
5
ST AGNES
ANNET
0
1,000
2,000
3,000
4,000
5,000 yards
X One, ✱ more than one immature S. striolatum
⊘ " , ⊛ " " " mature male S. striolatum
○ " , ⊙ " " " mature female S. striolatum
+ " I. elegans

FIG. 1

MAP OF ISLES OF SCILLY SHOWING ACTUAL AND POSSIBLE BREEDING AREAS OF ODONATA AND PLACES WHERE IMMATURE AND MATURE ODONATA WERE FOUND AWAY FROM WATER, JULY 26TH TO AUGUST 5TH, 1952 extreme west of St. Mary's had probably travelled at least 2,700 yards from its breeding area.

The following conclusions are drawn from the data obtained.

(1) Mature male and mature female *S. striolatum* may disperse up to at least 1,000 yards from their breeding areas.

(2) Immature male and female *S. striolatum* may disperse up to one mile or more from their breeding area.

(3) The dispersal movements of immature *S. striolatum* may result in their crossing short stretches of salt water.

(4) In comparison to *S. striolatum*, *I. elegans* appears to disperse much less far from its breeding areas.

(*d*) Intensive studies of small populations provide evidence on the circumstances of dispersal. The data of Corbet (1952) strongly suggest that when a new batch of recently matured *P. nymphula* arrived at the pond, some of the older individuals left it. Moore (1952a, 1953) showed that if density rose above about 13 male Anisoptera per 100 yards of narrow stream the surplus soon left it. There was some evidence that those that left belonged mainly to the smallest species present, and in other instances that they were the older insects. The data of both workers provides evidence for dispersal in the mature stage, and suggests that overcrowding may cause dispersal, but they do not show how far the surplus insects flew after leaving the breeding area.

Discussion and Conclusions

It has been shown in Parts I and II that dispersal takes place both in the pre-reproductive and in the reproductive stages of the imago. The emergence flight cannot be the cause of all dispersal in the pre-reproductive stage for it is essentially a flight *from* water (see below), and as such could not lead to the discovery of new water bodies. Also, it usually covers only a short distance. Similarly, the rare mass migrations cannot account for all dispersal in the reproductive stage. The records of Snow and Ross (1952) do in fact show that much migration is relatively inconspicuous. Further evidence for this is provided by the sudden appearance by water of the continental species *Sympetrum flaveolum* and *Sympetrum fonscolombii* in small numbers most years in Britain. With these facts in mind the following tentative classification of dispersal movements is put forward.

1. Emergence flight.
2. Wandering in immature stage.
3. Inconspicuous migration in immature stage.
4. Mass migration in immature stage.

TABLE IV

OCCURRENCES OF *S. striolatum* AND *I. elegans* AWAY FROM WATER IN THE ISLES OF SCILLY

Dragonflies	Distances of Dragonflies from the nearest actual or potential breeding area to nearest 100 yards																		
	0–200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
Mature† male *S. striolatum*	100+*			2	4	1			5+										
Mature† female *S. striolatum*	100+*				1				7+					1					
Immature (both sexes) *S. striolatum*	100+*	3		2	5+	1			8+	5		2		3	2			1	
I. elegans (both sexes, mature and immature)	100+*		1																

The figures show the total number of insects seen at the distances from water indicated.

* These figures are rough estimates only. No attempt to make accurate counts near water was made.

† Some of these were probably recently matured individuals which had yet to visit water for the first time, others showed signs of age—they had presumably last flown from their breeding areas as mature imagines.

5. Wandering in mature stage.
6. Inconspicuous migration in mature stage.
7. Mass migration in mature stage.

All these might but generally do not occur in one species.

The relative biological importance of these types of dispersal can only be assessed by considering the causes which initiate each one.

Observations and preliminary experiments (unpublished) show that the emergence flight is a flight *from* water not a flight to anything ; for example if another body of water is encountered during the emergence flight the insect often turns back and settles between the two. The insect frequently comes to rest in an unsuitable habitat (e.g. open field) when its cuticle has hardened it flies off again and seeks a more suitable one (e.g. sheltered bush in the sun). The distance travelled in the emergence flight depends largely upon temperature, wind conditions, topography and the insects' powers of flight at that moment. When long distances are covered this appears to be due almost solely to favourable external conditions.

Further dispersal movements in the pre-reproductive stage may result from the search for shelter and food, although under normal conditions this does not involve long flights (p. 408) : marking experiments show that immature dragonflies sometimes remain in the same area day after day, but in other instances the cumulation of short food flights etc. over several days may take the insect a long way from the place where it emerged. This haphazard type of movement is here included in the term "wandering," and is essentially different from migration where flight is mainly in one direction, and which is controlled by specific innate behaviour mechanisms.

When the insect becomes mature it undoubtedly seeks water; topographical memory may be used, or again movement may be largely random. When males have found a breeding area they normally roost by it and return to it day after day. Females may do so, but there is some evidence that they wander considerably more in the reproductive stage than do males—it is quite possible that the colonisation of new areas largely results from individual fertilised females finding them and ovipositing in them.

If the population density at the breeding area exceeds the critical number (see p. 414) some of the insects leave and seek out new breeding areas.

If a population becomes very dense—whether it consists of pre-reproductive or reproductive insects or both, part of it may migrate. Once a migration has begun other dragonflies from less populated areas may be attracted to the migrants and join them (Grassé 1932). Very high densities can be caused by a mass emergence of a species or by the restriction of breeding areas through drought etc. or both ; it is therefore not surprising that mass migrations appear to be commonest in areas where water bodies are few and often temporary. Biologically speaking the reduction of population pressure in the original breeding area may be a more important result of migratory behaviour than the colonisation of new areas.

The dispersal of Odonata depends on a complex of factors of which dispersal behaviour as such is only one. If the writer may hazard a guess it is that in Great Britain dispersal is mainly the result of the wandering of immature insects of both sexes and of fertilised mature females.

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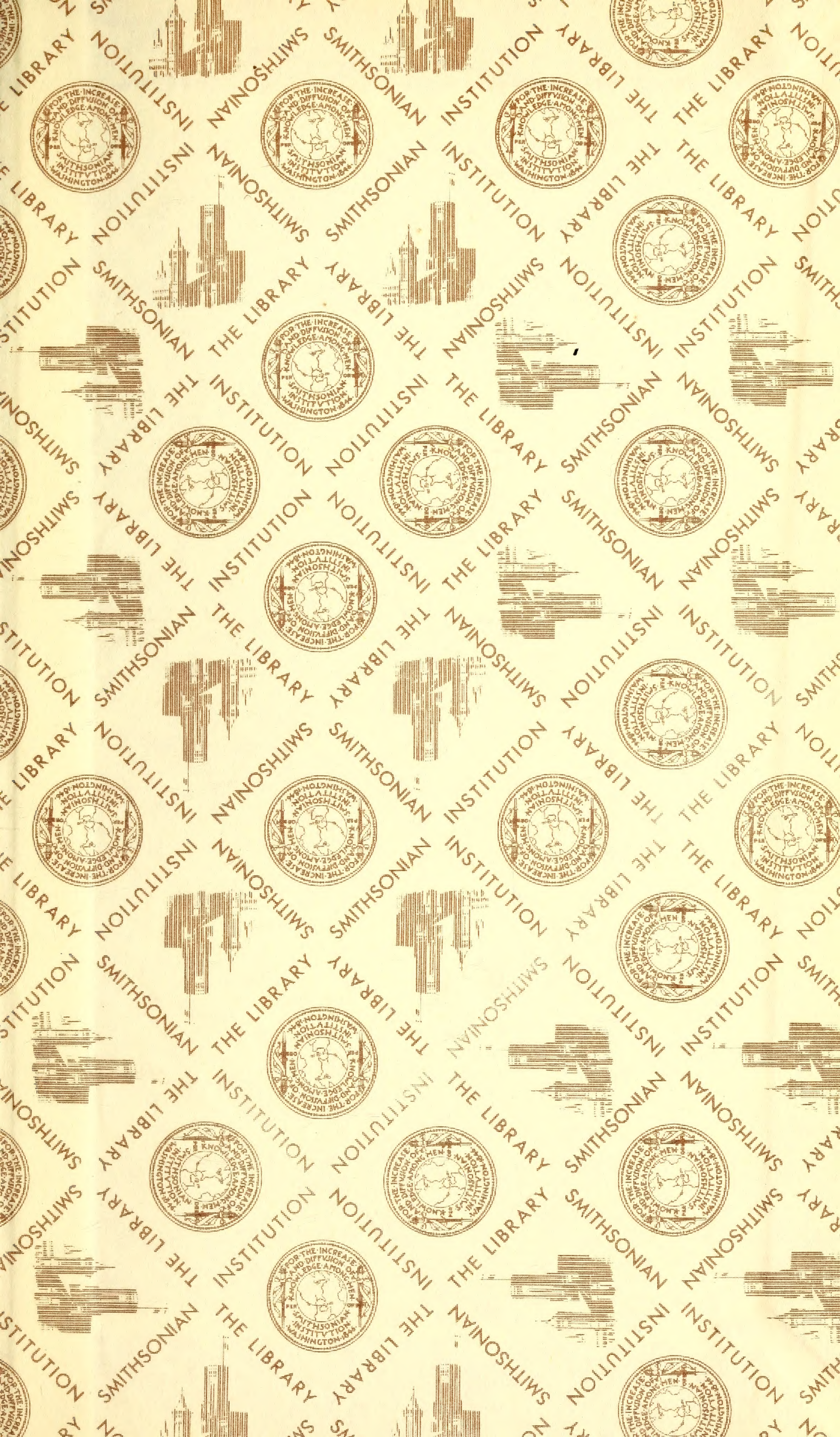
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